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XIV.

CONTRIBUTIONS FROM THE GRAY HERBARIUM OF HARVARD
UNIVERSITY, NEW SERIES, NO. VI.

By B. L. ROBINSON.

Presented January 10, 1894.

I. — THE NORTH AMERICAN ALSINEÆ.

THE following provisional treatment of the North American *Alsineæ* is based principally upon the material in the Gray Herbarium. An effort, however, has been made to see as large a representation of the group as possible, and with this end in view a number of other large and valuable collections have been visited; namely, the herbaria of the Department of Agriculture, Columbia College, the Missouri Botanical Garden, the Philadelphia Academy of Natural Sciences, the Boston Natural History Society, and the private collections of Mr. William M. Canby of Wilmington, Del., Mr. John Donnell Smith of Baltimore, and Mr. Walter Deane and Mr. Edward L. Rand of Cambridge, Mass. Those in charge of all these collections have most kindly allowed their *Caryophyllaceæ* to be examined, and all such specimens as showed any noteworthy peculiarities to be brought to Cambridge for critical study. From the herbaria of the Canadian Geological Survey, Iowa Agricultural College, and Natural History Society of Wilmington, Del., the entire representation of *Alsineæ* has also been most obligingly forwarded to the Gray Herbarium for examination.

While the study of such copious materials has obvious advantages, it by no means lessens, but rather increases, the difficulties of classification. In a long series of specimens individual variation becomes apparent in a way which can scarcely be realized if study is confined to fewer plants. Specific limitations often become very obscure, and sharp definition almost or quite impossible. Several instances of such practically confluent species occur in the present group, and in adjusting specific lines there is consequently great room for difference of opinion. Free criticism and friendly aid will be very

welcome, as much may thus be contributed to fulness and accuracy in the final treatment of this group for the "Synoptical Flora." To the botanists, both professional and amateur, who have most kindly assisted the author in his work upon the present paper, he would express sincere appreciation and cordial thanks. To the following he is especially indebted: Professors William Trelease and N. L. Britton, Mr. J. H. Redfield, Mr. F. V. Coville, Dr. J. N. Rose, Mrs. T. S. Brandegee, Miss M. E. Carter, Professor J. Macoun and Mr. J. M. Macoun, Professors T. C. Porter, L. H. Pammel, W. W. Bailey, and O. D. Allen, Messrs. William M. Canby, John Donnell Smith, Walter Deane, Edward L. Rand, Theodor Holm, and J. F. Collins. In the study of *Spergularia* an extensive series of Californian forms of that difficult genus, contributed to the Gray Herbarium by Mrs. T. S. Brandegee, has proved invaluable. In matters of synonymy and the citation of literature Dr. Watson's *Bibliographical Index* has again been a most useful guide.

CARYOPHYLLACEÆ, TRIBE I. SILENEÆ. Including genera 1-7. (See Proc. Am. Acad. xxviii. 124.)

TRIBE II. ALSINEÆ. Sepals free or slightly united at the very base. Petals more or less contracted but not unguiculate below. Corona absent. Flowers mostly small. Styles distinct to the base.

* Stipules none.

+ Capsule cylindric, more or less elongated, often curved, dehiscent by twice as many teeth as there are carpels.

8. Holosteum. Sepals 5. Petals 5, white, subentire or denticulate toward the apex. Stamens 3-5, very rarely 10. Styles 3 (occasionally 4 or 5), longitudinally stigmatic. Pod unicellular. Seeds numerous, dorsally flattened, i. e. parallel with the incumbent cotyledons; the radicle prominent upon the ventral surface. Inflorescence umbelliform.

9. Cerastium. Sepals in our species 5. Petals as many, retuse or bifid, very rarely subentire, white. Stamens 10, or sometimes fewer. Styles 5 (4 or 3). Capsule usually exceeding the calyx, often curved. Seeds numerous, more or less laterally compressed.

+ + Capsule ovoid or oblong relatively short, dehiscent by as many or twice as many teeth as there are carpels.

++ Styles usually fewer than the sepals, when of the same number opposite them.

10. Stellaria. Sepals 5 (-4). Petals 5 (-4, rarely abortive or absent), always more or less deeply bifid, often divided almost to the base, white. Stamens 3-10. Styles 3-4, rarely 5.

11. *Arenaria*. Sepals 5. Petals as many, white or nearly so, entire or emarginate (very rarely minute or wanting). Stamens 10, or often fewer by abortion. Styles 3 or 4. Seeds many.

++ ++ Styles as many as the sepals and alternate with them.

12. *Sagina*. Sepals 5, (rarely 4). Petals as many, entire or emarginate, white, rarely obsolete. Stamens usually 5, less frequently 3-10. Valves of the capsule as many as the sepals, and opposite them. Seeds several to many.

* * Stipules present, scarious: petals undivided.

13. *Spergularia*. Sepals 5. Petals 5 (rarely fewer or none), reddish or white. Stamens commonly 10. Styles 3 (very rarely 5); ovary 1-celled; valves of the capsule as many as the styles, when 5 in number alternate with the sepals. Seeds often margined. Leaves linear or filiform.

14. *Spergula*. Sepals 5. Petals 5. Stamens 10 (rarely 5). Styles 5; ovary unilocular, many-ovuled. Valves of the capsule 5, opposite the sepals. Seeds acutely margined or narrowly winged. Leaves narrow, linear, verticillate and fascicled in the axils.

TRIBE III. POLYCARPÆ. Including genera 15-18. (See Proc. Am. Acad. xxviii. 126.)

8. *HOLOSTEUM*, L. (ὅλος, all, and ὀστέον, bone; used ironically, since the plants are soft and weak.) — A small genus of Old World annuals and biennials much resembling *Cerastium* except in inflorescence and seeds. The commonest species is adventive in America. — Gen. no. 928; Reichb. Icon. Fl. Germ. v. t. 221; Gay, Ann. Sci. Nat. ser. 3, iv. 23; Benth. & Hook. Gen. i. 148.

H. *UMBELLATUM*, L. Finely glandular-pubescent, somewhat glaucous: stems 3-18 inches high: leaves sessile, ovate-oblong: umbels 3-12-flowered, terminal upon long naked peduncles; pedicels 8-12 lines long, some of them reflexed: filaments shorter than the calyx. — Spec. 88; Eng. Bot. i. 27. Locally naturalized in Pennsylvania, New Jersey, and Delaware, *Porter, Austin, Canby, Small*. (Adv. from Eur.)

9. *CERASTIUM*, L. MOUSE-EAR CHICKWEED. (κέρας, a horn, from the elongated curved capsules.) — Annuals or perennials, usually pubescent and often viscid. Leaves usually flat. Flowers white, borne in more or less expanded leafy or naked cymes. A genus distinguished from *Stellaria* and *Arenaria* somewhat by habit, but chiefly, although not always satisfactorily, by the form and dehiscence

of the capsule. — Gen. no. 376; Seringe in DC. Prodr. i. 414; Grenier, Flora, 1840, pt. 1, 266; Reichb. Icon. Fl. Germ. v.–vi. t. 228–236; Benth. & Hook. Gen. i. 148; Pax in Engl. & Prantl, Nat. Pflanzenf. iii. 1 b, 80.

§ 1. STREPHODON, Seringe, l. c. Styles 3–5: teeth of the capsule finally circinate-revolute from the tip. — Our species have pubescent leaves.

C. Texanum, BRITTON. Annual, viscid: stems several, slender, nearly erect, leafy below, nearly naked and dichotomous above: leaves oblanceolate or spatulate, 6 lines to 2 inches in length, very pubescent or subcinereous on both surfaces: flowers rather small: petals bifid: styles 3–4 (–5?): capsule $1\frac{1}{2}$ –2 times the length of the calyx. — Bull. Torr. Club, xv. 97. — Hills, Blanco, Texas, *Wright*; New Mexico on the Mongollons, *Greene*; Arizona, Santa Cataline Mts., *Lemmon*. (Mex., *Palmer*; Lower Calif., *Brandeggee*.)

C. maximum, L. Stoloniferous perennial with stems simple or nearly so, erect or decumbent, becoming a foot or more in height: leaves linear or lanceolate, attenuate: flowers very large for the genus, 1 inch in diameter, borne on erect pedicels in simple or branched cymes: sepals oblong or narrowly ovate, obtuse, 3–4 lines long: petals obovate, much exceeding the calyx, deeply notched at the apex: capsule symmetrical, much exserted at maturity. — Spec. 439; Ledeb. Icon. Fl. Ross. t. 242; Fenzl in Ledeb. Fl. Ross. i. 399; Seem. Bot. Herald, 51. *C. grande*, Greene, Pitt. ii. 229. — Alaska. (Siberia.) Asiatic specimens of this species, identified at the St. Petersburg Gardens, show that the capsule becomes cylindric and much longer than figured by Ledebour.

§ 2. ORTHODON, Seringe. Styles normally 5: teeth of capsule erect or spreading; the edges sometimes slightly reflexed. — DC. Prodr. i. 415. — Our species have pubescent leaves.

* Flowers comparatively small: petals $1-1\frac{1}{2}$ times as long as the sepals.

← Pods $1-1\frac{1}{4}$ times as long as the calyx: introduced or doubtfully indigenous weeds.

C. viscosum, L. (MOUSE-EAR CHICKWEED.) Annual, viscid pubescent, 3 inches to a span high: leaves oval or elliptic-oblong, very obtuse; the lowest narrowed below to a short margined petiole: flowers small, at first densely clustered at the ends of the branches, becoming laxer in fruit, but even the longest pedicels not exceeding the acute sepals ($1\frac{3}{4}$ –2 lines in length): bracts herbaceous: petals scarcely equalling the calyx: stamens frequently 5. — Spec. 437; Hook. f. Arc. Pl. 288; Wats. Bibl. Index, 101; Wats. & Coulter in

Gray, Man. ed. 6, 88. *C. vulgatum*, Linn. in herb.; Torr. & Gray, Fl. i. 187; Gray, Man. eds. 1-5; and others. *C. hirsutum*, Muhl. Cat. 46. *C. glomeratum*, Thuill. as used by Hooker, f. and others. *C. connatum*, Beck, Bot. 55. Depauperate forms with few flowers and short capsule have been regarded as indigenous, being the *C. viscosum*, var. *tenellum*, Grenier, l. c. 266, and the *C. semidecandrum*, auct. (not of Linn.). — Widely distributed in the United States and Canada, but much less common than the following; probably introduced from Europe. Delicate specimens apparently to be referred to this species, but with minute apetalous flowers, have been collected at San Diego, Calif., *Orcutt*.

C. VULGATUM, L. (COMMON MOUSE-EAR CHICKWEED.) Perennial, viscid-pubescent, a little taller and more spreading than the last: leaves oblong, obtusely pointed: flowers larger: the lower pedicels in fruit considerably exceeding the calyx: bracts herbaceous: sepals 2-3 lines long, obtuse, often purple-tipped, appearing acute through the infolding of the scarious margins: petals as long as the calyx. — Spec. ed. 2, 627; Regel, Ost-Sib. i. 432; Wats. Bibl. Index, 101; Wats. & Coulter in Gray, Man. ed. 6, 88. *C. viscosum*, Linn. in herb.; Torr. & Gray, Fl. i. 187; Gray, Man. eds. 1-5, etc. *C. fulvum*, Raf. Préc. Découv. 36. *C. triviale*, Link, Enum. Hort. Berol. i. 433. — Very common in fields, etc., but also often remote from habitations and cultivated ground, thus perhaps native. Flowering through the summer.

C. SEMIDECANDRUM, L. Near the two preceding, but smaller and with shorter leaves: the bracts, at least the upper ones, conspicuously scarious-margined: pedicels in fruit longer than the calyx. — Spec. 438; *C. vulgatum*, var. ? *semidecandrum*, Gray, Man. ed. 5, 94. — New Jersey, *Britton*, *Peters*, to Norfolk, Va., *Britton*, *Small*. (Adventive from Europe.)

+ + Pods 2-3 times as long as the calyx: indigenous species.

C. brachypodum. Pale green, finely pubescent and sometimes very viscid: leaves linear-oblong to oblanceolate, obtusish, seldom more than an inch in length: flowers in more or less open dichotomous cymes; pedicels, even the lower ones, only equalling or little exceeding the capsules, erect or deflexed, straight or gently curved, not hooked. — *C. nutans*, Raf., var. *brachypodum*, Engelm. in herb. — St. Louis, Mo., *Engelmann*, April, 1842, April-May, 1845; westward and southward to Nevada, *Anderson*, 238, *Watson*, 156; Arizona, *Palmer*; New Mexico, *Fendler*, 61; Texas, *Wright*. (Mex. *Schaffner*, *Palmer*.) *C. tenellum*, Fenzl, mentioned in *Watson's Index* (but never pub-

lished?), represented by Drummond's no. 30 of his 3d Texan Coll., appears to be only a more slender form of the above. Exactly the same thing, however, has been found at Milledgeville, Ga., by Dr. Boykin (Short Herbarium), thus considerably extending the range of the species. In raising Dr. Engelmann's variety to specific rank I follow the suggestion of Dr. N. L. Britton. Certainly, the more restricted geographic range and the absence of connecting forms indicate its distinctness from *C. nutans*. A very leafy and velvety tomentose form from Willow Spring, Arizona, *Palmer*, is worthy of mention.

Var. compactum. Inflorescence capitate-umbellate: pods very slender. — *C. nutans*, Raf., var. *compactum*, Engelm. in herb. — A marked variety or form from the Bad Lands of Nebraska, *Hayden*; Belknap, N. Texas, *Hayes*; False Washita, Ind. Terr., *Palmer*, 1868.

***C. nutans*, Raf.** A pubescent and viscid annual, 8–18 inches high: stems branched: leaves oblong-lanceolate, acute; the lowest narrowed toward the base: flowers numerous in an open dichotomous cyme: calyx about 2 lines in length: petals somewhat exserted, oblanceolate, bifid: pedicels elongated, ascending or spreading, tending to be hooked or nodding at the summit: capsule 4–6 lines long, nodding but curved upward. — Préc. Découv. 36, & Desv. Journ. Bot. iv. 269 (1814); Gray, Gen. ii. t. 114. *C. longepedunculatum*, Muhl. Cat. 46. *C. glutinosum*, Nutt. Gen. i. 291. *C. apricum*, Schlecht. Linnæa, xii. 208. *C. oblongifolium*, Anderson, Cat. Pl. Nev. 118. — Common and widely distributed from New England to the Pacific and from Hudson Bay to New Mexico. Like the last, paler green than the other common species. Apetalous specimens have been found at Wawa, Penn., *Brinton*. Arizona forms of this species also differ slightly in habit, but lack technical characters for satisfactory distinction.

***C. sericeum*, Wats.** Annual: stems one or many, 1–2 feet high, stout for the genus, sericeous, very leafy below: leaves oblong-lanceolate, sessile, 1–2 inches long, 3–6 lines broad; the lower cinereous with dense flocculent wool; the upper green: flowers numerous in spreading cymes: calyx $2\frac{1}{2}$ lines long, scarcely exceeded by the corolla. — Proc. Am. Acad. xx. 354. — S. Arizona in the Huachuca Mts., *Lemmon*; Santa Rita Mts., *Pringle*.

* * Flowers large; petals usually twice as long as the calyx: indigenous species.

***C. arvense*, L.** Perennial: stems several, weak, usually almost naked above: leaves linear to narrowly lance-oblong: petals obcor-

date: pod in the typical form scarcely longer than the calyx. — Spec. 438; Hook. Fl. Bor.-Am. i. 104; Torr. & Gray, Fl. i. 188; Hollick & Britton, Bull. Torr. Club, xiv. 45. ? *C. hybridum*, Muhl. Trans. Am. Phil. Soc. ser. 1, iii. 170. *C. Pennsylvanicum*, Hornem. Hart. Hafn. 435. — Rocky soil, common; May–July. (Eu., Asia, & S. Amer.) Very variable in size, pubescence, relative length of its capsules, etc. Var. *ANGUSTIFOLIUM*, Fenzl, l. c. i. 413, with cauline leaves narrowly oblong to linear, attenuate at the base, much fascicled and 9–15 lines in length, and var. *LATIFOLIUM*, Fenzl, l. c. i. 412, with shorter oblong leaves, 6–8 lines long, broad at the base, are forms strikingly different in their extremes, but rather freely intergrading and often difficult to distinguish. The latter is perhaps a little more common in the Rocky Mountains but extends eastward to Labrador. Better marked are the following.

Var. *oblongifolium*, HOLLICK & BRITTON. Leaves oblong or lance-oblong, obtuse or obtusish: capsule longer, $1\frac{1}{2}$ – $2\frac{1}{2}$ times as long as the calyx. — Bull. Torr. Club, xiv. 47, t. lxiii. *C. oblongifolium*, Torr. Fl. U. S. 460; Torr. & Gray, Fl. i. 188. ? *C. dichotomum*, Muhl. Cat. 46. ? *C. bracteatum*, Raf. Préc. Découv. 36. — Nova Scotia to Virginia, and Montana, *Scribner*, to New Mexico, *Vasey*. This variety has been widely drawn by its authors to include narrow-leaved forms as well as the original rather broad-leaved *C. oblongifolium*, extended series of specimens showing complete transitions.

Var. *maximum*, HOLLICK & BRITTON, l. c. xiv. 47. Taller, 1–2 feet high: leaves elongated, lanceolate, acutish, 2–3 lines broad: inflorescence very spreading: capsule equalling or half exceeding the calyx. — *C. oblongifolium*, Torr. Pacif. R. Rep. iv. 70. *C. pilosum*, Brew. & Wats., Bot. Calif. i. 67, not of Ledeb. — Dixon, Ill., *Vasey*, and in California, Punta de los Reyes, *Bigelow*, and elsewhere. Scarcely more than a rank growing form, but serving to connect the next species through var. *Fischerianum*.

Var. *villosum*, HOLLICK & BRITTON, l. c. xiv. 49. Densely villous: leaves rather broadly lanceolate. — *C. velutinum*, Raf. Med. Rep. (hex. 2), v. 359. *C. villosum*, Muhl. Cat. 46. Darlingt. Fl. Cest. ed. 2. 279. ? *C. hirsutum*, Darlingt. Florula Cest. 54. *C. oblongifolium*, Torr. & Gray, Fl. i. 188 in part; Wats. Bibl. Index, 101. — Lancaster Co., Penn., *Porter*.

Var. *Fuegianum*, Hook. f. Depauperate, 2–3 inches high, with short thickish imbricated leaves and sub-solitary terminal flowers. — U. S. Expl. Exped. 119. — Specimens collected by *Coulter* in the

Yellowstone Park have been confidently referred to this variety by Hollick and Britton, l. c., and *Parry's* no. 41 from Northwestern Wyoming is doubtless the same.

C. alpinum, L. Densely silky: stems weak, matted: leaves elliptic-ovate, in the typical form only 4–5 lines long: petals notched at the apex, $1\frac{1}{2}$ –2 times the length of the sepals. — Spec. 438; Torr. & Gray, Fl. i. 188; Regel, Ost-Sib. i. 433, 434. *C. lanatum*, Lam. Encycl. i. 680. *C. latifolium*, Greville, Mem. Soc. Wern. iii. 429. *C. vulgatum*, Hook. f. Arc. Pl. 288 in part. ? *C. latifolium*, Hart., Trimen's Journ. of Bot. ix. 205. — Arctic America from Greenland to Alaska, also in Labrador, the Hudson Bay region, and upon the Rocky Mountains of British America. (Europe and Asia.) The following varieties extend farther southward.

Var. *Beeringianum*, REGEL. Hirsute and less silky-villous, somewhat viscid above: leaves smaller, oblong. — Ost-Sib. i. 435. *C. Beeringianum*, Cham. & Schlecht., Linnæa, i. 62. *C. vulgatum*, var. *Beeringianum*, Fenzl in Ledeb. Fl. Ross. i. 409. — Alaska to the Rocky Mountains of Colorado and Arizona.

Var. *Fischerianum*, TORR. & GRAY. Hirsute, taller, 8–10 inches or even more than a foot in height: leaves rather thick, elliptic-lanceolate or oval-lanceolate, acute or acutish, an inch or more in length: capsule $1\frac{1}{2}$ –2 (or rarely 3) times the length of the calyx. — Fl. i. 188; Regel, l. c. i. 438. *C. rigidum*, Ledeb. Mem. Petr. v. 538. *C. Fischerianum*, Seringe in DC. Prodr. i. 419. *C. vulgatum*, vars. *grandiflorum* and *macrocarpum*, Fenzl in Ledeb. Fl. Ross. i. 409, 410. To judge from the figure in the Calques des Dessins *C. stellarioides*, Moç. should be referred here also, having been placed by Seringe probably through error in § *Strephodon*. — A stout variety passing to *C. arvense*, var. *maximum*, but with broader more elliptic-ovate leaves and longer capsules. Alaska to Humboldt Co., Calif., *Rattan*. (Siberia, Japan.) The leaves are thicker and the sepals more pubescent and acute than in *C. pilosum*, Ledeb., to which it is also nearly related.

Var. *glabratum*, Hook. Leaves and calyx nearly smooth. — Parry's 2d Voy. 390; Fl. Bor.-Am. i. 104. — Arctic America with the pubescent forms. (N. Eur.)

§ 3. *DICHODON*, Bartl. Styles normally 3: teeth of the capsule erect or slightly spreading, not circinate-revolute. — Endl. Gen. 970. — Our species with symmetrical capsule and short glabrous leaves.

C. trigynum, VILL. Perennial, with stems weak, spreading, somewhat matted, smooth or glandular-pubescent, loosely 2–3 flowered:

leaves oblong, 3-5 (-8) lines in length; the uppermost ovate: sepals lance-ovate or oblong, obtuse, 2-3 lines long: petals $1\frac{1}{2}$ -2 times the length of the calyx, obcordate, bifid nearly half way to the base: capsule oblong-conic, twice the length of the calyx; the teeth finally spreading. — Dauph. iii. 645, t. 46; Fenzl in Ledeb. Fl. Ross. i. 396. *Stellaria cerastoides*, L. Spec. 422; Torr. & Gray, Fl. i. 184; Hook. f. Arc. Pl. 288. — Table-topped Mountain, Gaspe, Lower Canada, *Allen*; Cape Chudleigh, Hudson Strait, *Bell*; Labrador, Greenland, *Holm*. (Europe and Siberia.) A species now generally appended to *Cerastium*, but forming a transition to *Stellaria*.

MÆNCHIA QUATERNELLA, Ehrh. (*Sagina erecta*, L., *Cerastium quaternellum*, Fenzl.) An erect glaucous annual with subsimple stems, 2-3 inches high, bearing 1 or 2 erect 4-parted flowers, was found in the thirties near Baltimore by *B. D. Greene*. It is said to have been recently rediscovered there, but nothing more definite has been learned concerning its American occurrence. (Europe.)

10. STELLARIA, L. CHICKWEED, STARWORT. (*Stella*, a star, in reference to the form of the flower.) — Low spreading herbs, sometimes a little succulent, mostly preferring a moist shaded habitat. Leaves flat or very rarely acerose. A genus conveniently but somewhat artificially separated from *Arenaria* by the more or less deeply cleft petals. — Spec. 421, & Gen. ed. 5, no. 504; Seringe in DC. Prodr. i. 396; Fenzl in Endl. Gen. 969; Reichb. Icon. Fl. Germ. v. t. 222-226; Benth. & Hook. Gen. i. 149; Gray, Gen. ii. t. 113; Pax in Engl. & Prantl, Nat. Pflanzenf. iii. 1 b, 79. *Spergularium*, Michx. Fl. i. 275. *Micropetalon*, Pers. Syn. i. 509. *Larbrea*, St. Hil. Mem. Mus. Par. ii. 287.

§ 1. MYOSOTON, Mönch (as genus). Styles 5, alternate with the sepals: leaves ovate acute. — Method. 225. *Malachia*, Fries, Fl. Hall. 77.

S. AQUATICA, Scop. Perennial, with stem strongly angled and somewhat pubescent: leaves large, ovate, or ovate-lanceolate, acute; the upper sessile, cordate; the lower petiolate: pedicels glandular-viscid, deflexed in fruit: petals $1\frac{1}{2}$ -2 times as long as the campanulate glandular-pubescent calyx: seeds numerous, dark-colored, tuberculately roughened. — Fl. Carn. ed. 2, i. 319. *Malachia aquatica*, Fries, Fl. Hall. 77. *Larbrea aquatica*, Seringe in DC. Prodr. i. 395 (excl. synonym.). — Becoming frequent upon waste land and public grounds in the Eastern States, and more or less established along roadsides in British America, Stratford, Ont., *Burgess*; Nanaimo, B. C., *Macoun*. (Adventive from Europe.)

§ 2. EUSTELLARIA, Fenzl, l. c. 969. Styles 3-4.

* Petals, except in some flowers of *S. pubera*, very deeply 2-parted (sometimes minute or wanting): segments narrow.

+ Lower leaves ovate, rather abruptly contracted into slender petioles.

S. MEDIA, Smith. (COMMON CHICKWEED.) A low annual: stem pubescent in lines: leaves acute; the upper narrower sessile, the lower on pubescent narrowly margined petioles: calyx glandular-pubescent, equalled or slightly exceeded by the capsule: petals shorter than the sepals: stamens 3, 5, or 10. — Eng. Bot. viii. t. 537. *Alsine media*, L. Spec. 272; Walt. Car. 117. *Holosteum succulentum*, L. Amœn. iii. 21; Nutt. Gen. i. 89; Torr. Fl. U. S. 159. — One of the commonest weeds in dooryards and cultivated grounds, especially in moist soil, flowering from early spring to late autumn.

S. prostrata, BALDW. Annual: stems weak, elongated, prostrate, pubescent: leaves ovate, acute or shortly acuminate, the lower subcordate on slender ciliated petioles; the upper cauline short-petioled or sub-sessile; the floral reduced and bractlike: pedicels filiform: flowers smaller than in the preceding: sepals in anthesis but a line long: petals nearly twice as long: mature capsule much exceeding the calyx; valves distinctly circinate-revolute. — Baldw. in Ell. Sk. i. 518; Torr. & Gray, Fl. i. 183; Gray, Pl. Lindh. ii. 152, & Pl. Wright. ii. 17; Chapm. Fl. 50. — Moist and shaded places, rocky woods; Georgia and Florida to Texas. (Adj. Mex.) Leaves very variable in size, from 2 lines to an inch in length. The flowers in this species are distinctly smaller than in the nearly related Mexican *S. cuspidata*, Willd., and *S. ovata*, Willd.

S. nitens, NUTT. Annual, slender, erect, shining: stems filiform, forked several times, leafy and slightly pubescent near the base, almost naked and quite glabrous above: leaves of two forms, the lowest (1-3 pairs) ovate, acute, only 2 lines long, on slender petioles of somewhat greater length, not always persisting; the other leaves lance-linear acute, 3-5 lines long: sepals very acute, scarious-margined, 1-3 nerved: petals half as long as the sepals, sometimes absent: capsule oblong, about equalling the calyx. — Torr. & Gray, Fl. i. 185; Torr. Pacif. R. Rep. iv. 69, & Bot. Mex. Bound. 37; Gray, Proc. Am. Acad. viii. 378. *S. mœnchioides*, Fenzl, acc. to Torr. & Gray, Fl. i. 675. *S. stricta*, Hook. Fl. Bor.-Am. i. 96 in part. — S. California to Brit. Columbia, *Macoun*; eastward to Utah, *Jones*; April, May.

S. GRAMINEA, L., with seldom persistent but sometimes slightly petiolate lower leaves, may possibly be sought here.

+ + Leaves acerose.

S. Kingii, WATS. Cespitose, minutely glandular-pubescent above: root woody: stems several, 2-7 inches high: leaves crowded below, rigid, pungent, light green: sepals spreading or somewhat reflexed during anthesis, scarious-margined, exceeded by the narrow petals. — Bot. King Exp. 39, t. vi. f. 1-3; Brew. & Wats. Bot. Calif. i. 68. — Humboldt Mts., N. Nevada, *Watson*; S. Utah, *Parry*, *Palmer*; July and August.

+ + + Leaves all sessile or subsessile, sometimes narrow, but not acerose.

++ Bracts small, scarious.

= Flowers small: petals minute or none.

S. umbellata, TURCZ. Smooth: stems weak, ascending from a decumbent rooting base: leaves varying from lanceolate and acute to elliptic-oblong, 3-8 lines in length: pedicels filiform, sub-umbellately grouped at the ends of the branches, often deflexed: sepals small, 1-1½ lines in length, glabrous, scarious-margined: capsule twice as long; the valves deeply 2-toothed; teeth obtuse. — Cat. Baic. 5, & Fl. Baic.-Dahur. i. 236; Fenzl in Ledeb. Fl. Ross. i. 394; Regel, Ost-Sib. i. 383, 399; Wats. Bot. King Exp. 38; Porter & Coulter, Fl. Col. 13; Brew. & Wats. Bot. Calif. i. 67. *S. borealis*, var. Hook. Fl. Bor.-Am. i. 94. — Mountains of Colorado and Arizona to Union Co., Oregon, *Cusick*. (Asia.)

= = Flowers of medium size: petals equalling or exceeding the calyx (except sometimes in *S. uliginosa*).

a. Seeds essentially smooth.

S. longifolia, MUHL. Stems sharply 4-angled, commonly 8 inches or more in height: leaves linear or linear-oblong, somewhat narrowed at each end, thickish, often ciliate toward the base; the larger ones 1¼-1½ inches long: flowers rather numerous in a lateral long-peduncled open cyme; pedicels spreading, horizontal or deflexed: petals and capsule exceeding the sepals: seeds smooth. — Cat. 45; Willd. Enum. 479; Fenzl, l. c. i. 392; Gray, Gen. ii. 38, t. 113, f. 1-5. *S. graminea*, Bigel. Fl. Bost. 110. *Spergulastrum gramineum*, Michx. Fl. i. 276. *Micropetalon gramineum*, Pers. Syn. i. 509. *M. longifolia*, Eat. & Wright, N. A. Bot. ed. 8, 319. — Canada to Maryland and westward to the Rocky Mts.; June and July. (Europe and Asia.)

S. longipes, GOLDIE. Smooth and shining or more or less glaucous, spreading at the base: branches erect, 3-12 inches high: leaves linear or lance-linear, gradually narrowed from the base to the acute apex, 1-nerved, 8-12 lines in length, spreading: flowers irregu-

larly cymose: peduncles terminal or rarely and tardily somewhat lateral; pedicels elongated, unequal, erect; the lowest often more or less distinctly axillary: sepals oblong-lanceolate: capsule exceeding the calyx, acutish, dark and shining; seeds very smooth. — Edinb. Phil. Journ. vi. 327; Hook. Fl. Bor.-Am. i. 95; Torr. & Gray, vars. α , β , and γ , Fl. i. 184; Fenzl, l. c. i. 386. *S. palustris*, Richardson, Frankl. Journ. 738. *S. stricta*, Richardson, Frankl. 2d Journ. 15. *S. læta*, Torr. Ann. Lyc. N. Y. ii. 169. *S. glauca*, Meyer, Pl. Lab. 93. *S. crassifolia*, Wats. Bot. King Exp. 38. *S. longifolia*, Rothr. Enum. Pl. Cent. Col. 35. ? *Micropetalon gramineum*, James, Cat. 181. — A variable species marked by its long dark-colored acutish capsule and very smooth seeds. It is widely distributed from Maine to Arctic America, and from Alaska (Siberia) southward along the Rocky Mountains to Colorado and on the Pacific slope to San Bernardino, *Parish*. The commoner form has acute sepals and leaves varying imperceptibly from flaccid and spreading to erect and somewhat pungent. (Var. β of Torr. & Gray, Fl. i. 185. *S. stricta*, Richardson, etc.) The typical form with spreading leaves and “very obtuse” sepals is comparatively rare. The following, although the best marked varieties, are connected by innumerable puzzling intermediate forms.

Var. *læta*, Wats. Low, smooth or somewhat pubescent, 1–4 inches in height, usually very glaucous, densely leafy at the base: leaves carinate, lanceolate-subulate to linear, rather rigid, erect, 2–6 lines long, shorter than in the type, narrower than in the following. — Bibl. Index, 112. *S. læta*, Richardson, Frankl. Journ. 738; Hook. in Parry’s 2d Voyage, 300, & Fl. Bor.-Am. i. 96. *S. stricta*, var. γ , Hook. l. c. i. 96. *S. longipes*, var. δ , Torr. & Gray, Fl. i. 185. — Arctic America to the Rocky Mountains of Montana and Wyoming to Gaspe, *Allen*. (Siberia.) A very similar form has been found on the coast of New Brunswick, *Fowler*. The variety *PEDUNCULARIS* of Fenzl is a boreal form somewhat intermediate between this variety and the next, and indefinitely characterized by still more elongated pedicels.

Var. *Edwardsii*, Wats. Low, smooth or pubescent: leaves lanceolate to ovate-lanceolate or even ovate, shorter than in the type: stems usually but 2–3-flowered; the lower peduncles axillary, much longer than the others. — Bibl. Index, 113. *S. Edwardsii*, R. Br. in Parry’s 1st Voy. 271, 308; Cham. & Schlecht. Linnæa, i. 48; Hook. Fl. Bor.-Am. i. 96, t. 31; Hornem. Fl. Dan. xiii. t. 2290. *S. nitida*, Hook. in Scoresb. Greenl. 411; Cham. & Schlecht. l. c.

i. 47. — British America from Labrador to British Columbia, northward to the Arctic regions; Alaska. (Siberia.)

b. Seeds distinctly rugose-roughened under a lens.

S. GRAMINEA, L. Stems ascending, smooth and shining, 1–2½ feet high, sharply 4-angled (rhombic in cross-section); internodes usually elongated: leaves lanceolate or lance-linear, thickish, attenuate, furrowed above and with midrib prominent beneath: inflorescence a broad terminal pedunculate cyme, often accompanied by one or two smaller cymes springing at its base; pedicels elongated, spreading, or deflexed: capsule exceeding the calyx. — Spec. 422; Eng. Bot. xii. t. 803; Fenzl in Ledeb. Fl. Ross. i. 391; Wats. & Coulter in Gray, Man. ed. 6, 87. — Introduced in moist grassy places, Nova Scotia to New Jersey, and in Northern States across the continent; common. (Europe.)

S. uliginosa, MURR. Low, weak, diffuse: stems numerous, leafy: leaves lanceolate or elliptic-lanceolate, 6–8 lines long, acute at each end: inflorescences few-flowered, pedunculate or sub-sessile, much smaller than in the last, becoming decidedly lateral, 1½ inches or less in length: flowers smaller and petals relatively shorter than in the related species: sepals very acute, 1¾ lines in length. — Comm. Gött. 1778, 55; Fenzl, l. c. i. 393; Eaton & Wright, N. A. Bot. 442; Warming, Bot. Foren. Festkr. 1890, 216, f. 10. *S. aquatica*, Poll. Palat. i. 429; Torr. & Gray, Fl. i. 186. *S. alsine*, Hoffm. Fl. Germ. i. 153; Muhl. Cat. 45; *S. borealis*, Darlingt. Fl. Cest. 274. *Larbreia uliginosa*, Hook. Fl. Bor.-Am. i. 93. — Swamps, Atlantic slope, Halifax (*Macoun*) to Maryland; rare. (Europe.)

↔ ↔ Bracts foliaceous (except in *S. borealis*, var. *corollina*.)

= Leaves narrowly elliptical to lanceolate or linear.

S. longipes, GOLDIE, may be sought here, as weak specimens with solitary terminal long-peduncled flowers do not always show the scarious bracts which are developed in more vigorous plants.

S. borealis, BIGEL. Suberect, 6–10 inches in height, smooth or nearly so: leaves lanceolate, attenuate, 6–18 lines long, with one prominent nerve: pedicels scattered, 8–14 lines in length, often deflexed: sepals ovate-lanceolate, scarious-margined, acute or often narrowed to an obtusish apex: petals much shorter than the calyx or none: capsule narrowly ovoid, acutish, 1½–2 times as long as the sepals; seeds smooth. — Fl. Bost. ed. 2, 182; Torr. & Gray, Fl. i. 185; Fenzl, l. c. i. 381; Vahl, Fl. Dan. xiv. t. 2355. *S. calycantha*, Bong. Sitch. 127. *S. crassifolia*, Boland. Cat. 6. *Spergulastrum*

lanceolatum, Michx. Fl. i. 275. *Micropetalon lanceolatum*, Pers. Syn. i. 509. *Arenaria calycantha*, Ledeb. Mem. Acad. Petr. v. 534. *A. lateriflora*, Darlingt. Florula Cest. 54. — New England to New Jersey; Mendocino Co., Calif., and northward; flowering in mid summer; frequent.

Var. *corollina*, FENZL, l. c. i. 382. Taller: inflorescence spreading and more definitely terminal: bracts reduced, the uppermost more or less scarious: petals usually present: seeds slightly roughened. — *S. brachypetala*, Bong. Sitch. 126; Torr. & Gray, Fl. i. 186. *S. alpestris*, Fries, Mant. i. 10, excl. var. *S. Fenzlii*, Regel, Ost-Sib. i. 399. *S. borealis*, var. *alpestris*, Gray, Man. ed. 5, 93. — Lake Superior, Robbins, to Oregon, Howell, and northward. (Europe and Asia.)

S. crassifolia, EHRH. Low, smooth: stems many, weak, ascending or suberect, internodes short: leaves small, numerous, thickish, oblong-lanceolate, acutish, 3–6 lines in length: sepals ovate-lanceolate, acuminate, somewhat exceeded by the petals and capsule: seeds distinctly roughened under a lens. — Beitr. iii. 60; Fenzl, l. c. i. 383; Chapm. Fl. ed. 2, 608; Wats. & Coulter in Gray, Man. ed. 6, 87, excl. Kentucky plant. *S. gracilis*, Richardson, Frankl. Journ. 738; Hook. Fl. Bor.-Am. i. 97; Torr. & Gray, Fl. i. 184. *S. borealis*, var. β , Hook. l. c. i. 95. — Labrador, Martin, Allen, to Illinois, Vasey, Hill; Montana, Canby, and northward.

S. fontinalis. Glabrous, stems regularly and dichotomously branched, 6–12 inches long: branches spreading: leaves spatulate-linear, obtusish, spreading, 5–10 lines long: internodes elongated, 1–2 inches in length: peduncles solitary in the forks of the branches, 1–1½ inches long, ascending: sepals 4–5, oblong, obtuse, 3-nerved: petals none: stamens 4–8: styles 3–4, very short: capsule obtuse, not exceeding the calyx. — *S. crassifolia*, Wats. Bibl. Index, 111 in part; Wats. & Coulter in Gray, Man. ed. 6, 87 in part. *Sagina fontinalis*, Short & Peter, Transylv. Journ. Med. 28, 600; Torr. & Gray, Fl. i. 177. *Spergula fontinalis*, Dietr. Syn. Pl. ii. 1597. — Cliffs of Kentucky River and Elkhorn Creek, Kentucky, Short & Peter; Nashville, Tenn., Gattinger; April, May. This too little known plant, of distinctly aquatic habit, merits further study with more abundant material. It is certainly distinct from *S. crassifolia*, Ehrh.

S. humifusa, ROTH. Low, densely matted, smooth: stems prostrate or ascending, angulate, shining: leaves elliptic-ovate or oblong, acutish, 2–5 lines long, marcescent: peduncles axillary, 4–7 lines in length: sepals ovate-oblong, acute, narrowly margined: petals

somewhat exceeding the calyx: seeds smooth. — Act. Hafn. x. 447, t. 4, f. 14; Torr. & Gray, Fl. i. 184; Fenzl in Ledeb. Fl. Ross. i. 384. *S. marginata*, Cham. & Schlecht. Linnæa, i. 50. *Arenaria thymifolia*, Pursh, Fl. 317; Eaton & Wright, N. A. Bot. 132. *A. Purshiana*, Seringe in DC. Prodr. i. 414; Hook. Fl. Bor.-Am. i. 102. — Salt marshes and boggy slopes, Little Cranberry Island, Maine, *Redfield*, and coast of Oregon, *Howell Bros.*, northward to Alaska and Arctic America. (Greenland; N. Asia.) The commoner form, var. *ovalifolia*, Fenzl, l. c., has leaves ovate or sub-orbicular, crowded, but 1-3 lines in length; var. *oblongifolia*, Fenzl, l. c., has more elongated internodes and oblong leaves, 4-5 lines long.

S. obtusa, ENGELM. Smooth: stems prostrate, 2-3 inches long: leaves thin, ovate, acute, about 4 lines long, half as broad: flowers solitary, appearing axillary: peduncles 3-4 lines long: sepals ovate, obtuse, hardly at all scarious on the margins: petals none: capsule $1\frac{1}{4}$ - $1\frac{1}{2}$ times as long as the calyx, obtuse; seeds brown, under a compound microscope covered with lighter colored oblong tubercles with fringed edges. — Bot. Gaz. vii. 5; Macoun, Cat. Canad. Pl. 76. *S. humifusa*, Macoun, Phænog. & Cryptog. Pl. of Canad. 9. — Anthracite Creek, Colorado, 9,000-10,000 feet, *Brandegge*; near Macleod's Lake, Brit. Columbia, *Macoun*; Kootanie Pass, B. C., *Dawson*; June, July.

S. crispa, CHAM. & SCHLECHT. Smooth, or more rarely pubescent: stems numerous, weak, decumbent: leaves thin, ovate, acuminate, commonly crisped on the edges: pedicels solitary, 3-6 lines long: sepals lanceolate, acute, margined, 3-nerved, considerably exceeded by the acutish capsule: petals minute or none. — Linnæa, i. 51; Hook. Fl. Bor.-Am. i. 97; Torr. & Gray, Fl. i. 186, 675; Gray, Proc. Am. Acad. viii. 378. *S. borealis*, var. *crispa*, Fenzl ex Torr. & Gray, Fl. i. 675; Torr. Bot. Wilkes Exp. 245. *S. borealis*, var. *apetala*, Regel, Ost-Sib. i. 396 in part. — Mountainous regions of N. Calif. to Alaska.

S. ruscifolia, WILLD. Glabrous: leaves coriaceous, ovate, subcordate, acuminate, somewhat rigid with pungent tip: flowers rather large, terminal, pedunculate: sepals acute. — Willd. in herb. acc. to Schlecht. Berl. Gesell. Nat. Fr., Mag. 1816, 194; Cham. & Schlecht. l. c. i. 50; Regel, Ost-Sib. i. 419. (Siberia, Kamtschatka.)

Var. *arctica*, REGEL, l. c. i. 420. "Low stems, scarcely an inch in length, sepals obtuse. — On the Melville Islands."

= = Leaves broad, an inch or more in length.

S. littoralis, TORR. Pubescent; stems decumbent, dichotomously branched, 8 inches in height: leaves ovate, rounded at the

base, acute or acuminate, about an inch in length, with definite intramarginal veins: flowers rather numerous in the forks of the branches; peduncles becoming horizontal or reflexed: sepals $2\frac{1}{2}$ lines long, acute: petals of nearly equal length, cleft almost to the base: capsule somewhat shorter. — Pacif. R. Rep. iv. 69; Brew. & Wats. Bot. Calif. i. 68. — Coast of Marin Co., Calif.; Punta de los Reyes, *Bigelow*; Dillon's Beach, *Congdon*. In habit much resembling the Old World *S. dichotoma*, L., of which it may well prove a form. It differs, however, in its much more deeply cleft petals.

S. pubera, MICHX. (GREAT CHICKWEED.) Perennial, decumbent, stout for the genus: stems pubescent in lines: leaves elliptic-oblong, finely ciliate, acute or obtusish, $\frac{1}{2}$ – $1\frac{1}{2}$ inches long, or on the late tall and mostly sterile shoots 3 inches in length: calyx nearly or quite smooth; sepals 3– $4\frac{1}{2}$ lines in length: stamens 10: capsule globose, not exceeding the calyx. — Fl. i. 273; Darl. Fl. Cest. 274; Torr. & Gray, Fl. i. 183. — Rocky woods, Pennsylvania to Georgia, westward to Tennessee, Kentucky, and Indiana. Professor Britton calls attention to the fact that the teeth of the capsule become circinate-revolute, as in *Cerastium* § *Strephodon*. Miss E. F. Andrews states that the petals are sometimes cleft half their length, in other cases nearly to the base, which is confirmed by specimens.

* * Petals retuse or shortly bifid, divided but $\frac{1}{4}$ – $\frac{1}{2}$ the way to the base, commonly considerably exceeding the calyx: species approaching *Arenaria*.

+ Glabrous or nearly so.

S. uniflora, WALT. Weak and slender: stems decumbent or suberect, a foot in length: leaves linear, acute, or the lower lanceolate, gradually narrowed below, mucronate, 8–12 lines in length; the floral much reduced: flowers few, solitary, on elongated slender peduncles: calyx soft in texture; sepals scarcely veined. — Car. 141; Torr. & Gray, Fl. i. 184; Chapm. Fl. 50. *Arenaria glabra*, Ell. Sk. i. 520, not Michx.; Wood, Bot. & Fl. 56. *Alsine Walteri*, Gray, Gen. ii. 34. — Moist meadows, North Carolina to Florida and Alabama, *Winchell*; March to May.

S. MACROPETALA, Torr. & Gray, appears to be only a form of *Arenaria patula*, Michx., a species in which the petals vary from entire to retuse or even bifid.

S. HOLOSTEA, L. Stem sharply 4-angled, 6–18 inches high: leaves narrowly lanceolate, spreading, long-attenuate from near the rounded sessile base, often ciliated, $1\frac{1}{4}$ –3 inches in length, 1-nerved: sepals lance-oblong, thin, nerveless, 4 lines in length, exceeded by the large white petals: styles 3: valves of the capsule at length circinate-

revolute. — Spec. i. 422; Reichb. Icon. Fl. Germ. v. t. 223. — Found more or less established at Train's Meadow Road, Long Island, *Ruger*; Poland, Maine, *Miss Furbish*. (Adv. from Europe.)

+ + Glandular-pubescent.

S. dichotoma, L. Stems terete, profusely and dichotomously branched: leaves ovate to ovate-lanceolate, acute or acutish, cordate, spreading, 6–12 lines in length: peduncles 1-flowered, springing from the forks of the branches, considerably exceeding the leaves, commonly deflexed in fruit: sepals lanceolate, acute, usually about equaling the petals. — Spec. 603; Fenzl in Ledeb. Fl. Ross. i. 378. — An Asiatic species of great variability.

Var. *Americana*, PORTER, in litt. Leaves oval, obtusish: sepals oblong, obtuse, but $1\frac{1}{2}$ lines long, considerably exceeded by the rather narrow white petals. — Collected near Virginia City, Montana, 1871, by *W. B. Platt* on the Hayden Survey, and sent to the Gray Herbarium by Prof. T. C. Porter. A portion of the same material has been kindly examined by Messrs. Batalin, Korshinsky, and Lipsky, who pronounce it a variety or form of *S. dichotoma*, near var. *cordifolia*, Bunge, but with more obtuse leaves and sepals.

S. Jamesii, TORR. Viscid above: stem strongly angled: leaves elongated, lanceolate, attenuate, smooth, 2–4 inches in length, 3–8 lines broad near the closely sessile base: flowers in a leafy terminal panicle: sepals oblong, herbaceous, 2 lines in length. — Ann. Lyc. N. Y. ii. 169 (as *S. Jamesiana*); Pacif. R. Rep. iv. 69; Torr. & Gray, Fl. i. 183; Wats. Bot. King Exp. 38. ?*S. graminea*, James, Cat. 181. — Woodlands and "creek bottoms," Rocky Mts. of Colorado, New Mexico, and Arizona to Northern California and Washington, *Brandegee*.

S. Nuttallii, TORR. & GRAY. Annual, a span high: leaves linear-oblong, obtusish; the upper much reduced but not scarious: flowers in dichotomous racemes; pedicels horizontally spreading, 9 lines in length: corolla 6–8 lines broad. — Fl. i. 183; Fielding, Sert. Pl. t. 18. *Alsine Drummondii*, Fenzl ex Torr. & Gray, l. c. i. 675. *Alsine Nuttallii*, Gray, Gen. ii. 34. — Arkansas, *Nuttall*; Louisiana, *Hale*; Central Texas, *Wright*, *Lindheimer*, *Drummond*, *Hall*, etc.

11. ARENARIA, L. SANDWORT. (*Arena*, sand, a sandy place, from the habitat of several species.) — A composite genus, and, when taken as here in its more comprehensive sense, the largest of the *Alsineæ*. Plants of wide distribution both as regards latitude and altitude, and possessing in consequence much variability in aspect; being either slender annuals or herbaceous perennials of the habit of

Stellaria, or often more densely tufted and occasionally distinctly woody at the base. Leaves sessile or nearly so, either flat and with a well developed blade or more frequently awl-shaped or acerose. Flowers of *Stellaria*, but with petals entire or barely retuse (sometimes more deeply cleft in *A. patula*, Michx.). — Gen. no. 374 in part; Torr. & Gray, Fl. i. 178; Reichb. Icon. Fl. Germ. v. t. 216–219; Benth. & Hook. Gen. i. 150; Wats. Bibl. Index, 94; Hook. & Jackson, Index Kew. i. 178.

§ 1. MÆHRINGIA, L., as amended by Fenzl. Seeds, at least when young, provided at the hilum with a light-colored spongy appendage (strophiole). Habit of *Stellaria*. — Fenzl in Endl. Gen. 968; DC. Prodr. i. 390; Gray, Gen. ii. t. 112.

A. lateriflora, L. Stems terete, weak, often decumbent, puberulent: leaves elliptic-oblong or oval, obtuse or rounded at the apex, thin, puberulent, 5–10 lines long; the veins and edges beneath covered with a fine spreading pubescence: cymes pedunculate and somewhat umbellately few-(1–6-)flowered: sepals ovate, obtuse or scarcely acute, $1\frac{1}{4}$ lines long, but one third to one half the length of the obovate petals: filaments pubescent. — Spec. 423; Hook. Fl. Bor.-Am. i. 102, t. 36; Torr. & Gray, Fl. i. 182, 675. *A. Pennsylvanica*, Muhl. Ind. Fl. Lanc. 169. *A. buxifolia*, Poir. in Lam. Encycl. vi. 362; Torr. & Gray, Fl. i. 182. *A. Haenkeana*, Bartl. in Presl, Rel. Haenk. ii. 15. *Stellaria biflora*, Pursh, Fl. 317. *Mæhringia lateriflora*, Fenzl, Verbr. Alsin. 18, 38, & Ledeb. Fl. Ross. i. 371; Gray, Gen. ii. 36, t. 112. — New England to New Jersey, Colorado, Oregon, and northward to the Arctic Ocean.

A. macrophylla, Hook. Stems decumbent, angled, pulverulent-pubescent: leaves lanceolate, acutish to acuminate at both ends, (less commonly elliptic, obtusish,) 1–3 inches in length, glabrous, more or less punctate: peduncles slender, terminal or becoming axillary, 1–5-flowered: sepals ovate-lanceolate, very acuminate, exceeding the petals. — Fl. Bor.-Am. i. 102, t. 37; Torr. & Gray, Fl. i. 182; Torr. Pacif. R. Rep. iv. 69; Gray, Proc. Am. Acad. viii. 378; Greene, Fl. Francis. 125. *Mæhringia macrophylla*, Torr. Bot. Wilkes Exp. 246. — Extending from San Diego (*Orcutt*) northward through California, Oregon, and Washington into British America, and eastward to Isle St. Ignace, Lake Superior, *Wheeler*; April to August. While the essential floral characters remain the same, there is considerable variation in the size, texture, and shape of the leaves.

§ 2. AMMADENIA. Styles 3–5: disk conspicuous, 10-lobed and glanduliferous: capsule globose, somewhat baccate; seeds not strophio-

late. — Gmelin, Fl. Sib. iv. 160 (proposed as genus). *Arenaria* § *Ammodenia*, Benth. & Hook. Gen. i. 151. *Honkenya*, Ehrh. Beitr. ii. 180. *Halianthus*, Fries, Fl. Hall. 75. *Adenarium*, Raf. Journ. Phys. 1818, 259. — A single stout fleshy species of maritime habitat, with axillary flowers.

A. peploides, L. Perennial, glabrous: stems a span in height, stout, angled: leaves thick, ovate or obovate, 1-nerved, shortly pointed, clasping at the broad base: sepals ovate-lanceolate, acuminate, $3\frac{1}{2}$ lines in length, about equalling the petals. — Spec. 423; Pursh, Fl. 317. *Alsine peploides*, Crantz, Inst. ii. 406. *Honkenya peploides*, Ehrh. l. c. ii. 181; Torr. & Gray, Fl. i. 176; Fenzl in Ledeb. Fl. Ross. i. 358; Gray, Gen. ii. 32, t. 110. *Adenarium peploides*, Raf. l. c. 259. — Seashores, from New Jersey and Washington State, *Henderson*, northward. (Northern Europe and Asia.) On the Northwest Coast the commoner form is

Var. *major*, Hook. Taller: leaves longer, often 15 lines in length, oblong or oblanceolate, more pointed and decidedly narrowed to the base. — Fl. Bor.-Am. i. 102. *A. Sitchensis*, Dietr. Syn. Pl. ii. 1565. *Honkenya oblongifolia*, Torr. & Gray, Fl. i. 176. *Honkenya peploides*, var. *oblongifolia*, Fenzl in Ledeb. Fl. Ross. i. 358.

§ 3. *MERCKIA*. Styles 3-5; ovary 3-5-celled: capsule large, depressed-globose, somewhat inflated, many-seeded; seeds not strophio-late. — Fisch. ex Cham. & Schlecht, Linnæa, i. 59 (as genus). Fenzl, l. c. i. 359; Pax in Engler & Prantl, Nat. Pflanzenf. iii. 1 b, 84. *Arenaria* § *Merckia*, Benth. & Hook. Gen. i. 151. — A single glandular and slightly fleshy species of the Northwest.

A. physodes, Fisch. Perennial, cespitose; stems weak, decumbent, 3-6 inches in length: leaves ovate, cuspidately pointed, 4-6 lines long: flowers solitary at the summit of the stem or becoming lateral: sepals lance-oblong, acute, 3 lines in length, equalling or slightly exceeding the petals: capsule 4 lines (said to become half an inch) in diameter. — Fisch. in DC. Prodr. i. 413; Wats. Bibl. Index, 97. *Merckia physodes*, Fisch. l. c. i. 59; Hook. l. c. i. 103; Torr. & Gray, Fl. i. 176. *Stellaria ovalifolia*, Hook. l. c. i. 97; Hook. & Arn. Bot. Beech. 122. — Brit. Columbia to N. Alaska; July, August.

§ 4. *EUARENARIA*. Styles normally 3: capsule ovoid, dehiscent by three two-toothed or cleft valves; seeds not strophiolate. — *Arenaria* of many authors, as Fenzl in Ledeb. Fl. Ross. i. 360; Regel, Radde's Reisen in Ost-Sib. i. 334; Pax in Engl. & Prantl, Nat. Pflanzenf. iii. 1 b, 84, etc.

* Leaves ovate, elliptic or linear, not acerose.

← Annuals.

A. SERPYLLIFOLIA, L. (THYME-LEAVED SANDWORT.) Annual, finely pubescent, much branched: leaves very short, $2-3\frac{1}{2}$ lines in length, ovate, acute or acuminate, rather distinctly 3-5-nerved, rounded at the base; the lowest only being narrowed to a short petiole: flowers numerous in open leafy cymes; pedicels 1-3 times the length of the ovate-lanceolate acuminate hispidulous sepals: petals small, about two thirds the length of the sepals: capsule flask-shaped. — Spec. 423; Michx. Fl. i. 274; Ell. Sk. i. 518; Torr. & Gray, Fl. i. 182. — Sandy soil, Lower Canada and New England to Florida and to Oregon, Washington, and British Columbia. (Nat. from Europe.)

Var. **TENUIOR, Koch.** More delicate: leaves reduced: flowers smaller in a nearly naked racemose panicle: capsule more oblong. — Synop. 117. *A. leptoclados*, Guss. Fl. Sic. Syn. iii. 824. — Portland, Oregon, *Brandegee*. Suksdorf's specimens from McCloud Lake are somewhat similar. (Europe.)

A. Bentharii, FENZL in herb. A slender annual, branched from the base; branches finely pubescent in lines: leaves short, 3-4 lines in length, elliptic-lanceolate, acute and apiculate, often punctate, narrowed to a sessile base, or the lowest to short ciliated petioles; floral leaves much reduced: pedicels filiform, many times exceeding the ovate acuminate glabrous often punctate sepals: seeds dark brown, minutely tuberculate. — Torr. & Gray, Fl. i. 675; Gray, Pl. Wright. ii. 18; Torr. Bot. Mex. Bound. 36. *A. monticola*, Buckley, Proc. Acad. Philad. 1861, 449. — Rocky ground, Texas, *Drummond*, *Wright*, *Thurber*, *Hall*, *Reverchon*; New Mexico, *Thurber*.

← ← Perennials.

A. ciliata, L. Minutely glandular-puberulent: stems numerous, slender, terete, leafy, densely matted, or in less exposed situations spreading and ascending, 1-5 inches long, terminally 1-3-flowered: leaves small, ovate-oblong or lance-oblong, scarcely acute, 1-3 lines in length, distinctly ciliate near the cuneate base: peduncles erect, 2-5 lines long: sepals ovate-oblong, obtuse, nerved, $1\frac{1}{4}-1\frac{1}{2}$ lines long: petals of similar shape and equal length: stamens 8-10: valves of the capsule rather deeply bifid exceeding the calyx. — Spec. 425; DC. Prodr. i. 411; Fenzl in Ledeb. Fl. Ross. i. 370. (High mountains and arctic regions of Europe.)

Var. (?) **humifusa, HORNEM.** Leaves without ciliation: sepals nerveless. — Hornem. ex Lange, Pl. Græn. 132. *A. Norvegica*, Gunn, Fl. Norv. ii. 145, t. ix. f. 7-9. *A. humifusa*, Wahlb. Fl. Lap.

129. — Rich soil, British America, Mt. Albert, Gaspé, *Allen, Porter*; Lake Mistassini, *J. M. Macoun*, and what is with scarcely a doubt the same thing at Kicking Horse Lake in the Rocky Mts., *J. Macoun*. (Greenland, N. Europe.)

A. alsinoides, WILLD. in herb. Minutely pubescent with slightly hooked hairs or smoothish: stems long, procumbent, moderately branched: leaves narrowly elliptic, acute, narrowed below, commonly pseudoverticillate, 8–10 lines long, punctate: flowers axillary, solitary at the nodes: pedicels filiform, elongated, spreading or horizontal, nearly or quite an inch in length: sepals ovate, acute, tuberculate-punctate, $1\frac{3}{4}$ lines long: petals commonly smaller or wanting: seeds smooth and shining. — Schlecht. Berl. Mag. Naturf. Freunde, vii. (1816), 201; Wats. Proc. Am. Acad. xvii. 327. *A. diffusa*, Ell. Sk. i. 519. *A. nemorosa*, HBK. Nov. Gen. et Sp. vi. 35. *A. lanuginosa*, Rohrb. in Fl. Bras. xiv.² 274, t. 63. *Spergulastrum lanuginosum*, Michx. Fl. i. 275. *Micropetalon lanuginosum*, Pers. Syn. i. 509. *Stellaria elongata*, Nutt. Gen. i. 289. *S. lanuginosa*, Torr. & Gray, Fl. i. 187, 675. — Moist shaded ground, North Carolina to Florida and Texas, *Drummond, Hall*. (Mexico and S. Amer.)

A more western form, represented from New Mexico by Fendler's 58 and 62 and Wright's 864, has slightly firmer stems, more numerous sub-paniculate flowers, and leaves less narrowed at the base. In all these respects it shows a transition to the following.

A. saxosa, GRAY. Finely puberulent but green: stems many, spreading from a rather stout root, decumbent or creeping at the base, 2 inches to a foot long: leaves numerous, opposite, not fascicled or pseudoverticillate (sometimes crowded), slightly fleshy, lance-oblong, acute, mucronate, 2–9 lines long, sessile by a scarcely narrowed base: flowers terminal and subsolitary on short simple peduncles or in stouter individuals numerous and more or less paniculate: petals almost or quite equalling the ovate-lanceolate sharply acuminate slightly fleshy sepals. — Pl. Wright. ii. 18; Walp. Ann. iv. 258. *Mæhringia umbrosa*, Gray Pl. Fendl. 13, & Pl. Wright. ii. 18, not Fenzl. — Colorado, *Brandege, Hooker & Gray*; Guadalupe Mts., Texas, *Havard*; New Mexico, *Fendler, Wright*; Arizona, *Rothrock, Lemmon, Jones, Rusby*. (Lower California, *Orcutt*.) A species of wide range, occurring alike in rocky subalpine regions and much lower upon sandy banks, accordingly varying much in height and diffuseness of branching. The type is a condensed few-flowered form.

Var. cinerascens. Somewhat more rigid, and grayish throughout with a fine pubescence: leaves pungent. — Huachuca Mts., Arizona, *J. G. Lemmon*. (Herb. Columbia Coll.)

* * Leaves very narrowly linear, commonly acerose and often rigid and pungent; western species.

+ Sepals broadly ovate, obtusish, sometimes apiculate: flowers not densely aggregated.

A. capillaris, POIR. Leaves chiefly grouped at the base in fascicles upon a multicipital caudex, $\frac{1}{2}$ – $2\frac{1}{2}$ inches long, somewhat pungent, little spreading; the cauline few pairs, much reduced: stems 4–8 inches in height: petals obovate, considerably exceeding the short obtuse sepals. — Poir. in Lam. Encycl. vi. 380; Regel, Ost-Sib. i. 366. *Alsine nardifolia*, Anderson, Cat. 118. The typical glabrous form with straight leaves is comparatively rare in America but occasionally occurs with var. *NARDIFOLIA*, Regel, l. c. i. 372, which is glabrous with curved leaves (*A. nardifolia*, Ledeb. Fl. Alt. ii. 166, & Icon. Fl. Ross. 6; Hook. Fl. Bor.-Am. i. 98, t. 32), and the more common form var. *FORMOSA*, Regel, l. c. i. 371, which has the stem and inflorescence glandular. (*A. formosa*, Fischer in DC. Prodr. i. 402; Hook. f. Arc. Pl. 287, 322; Torr. Bot. Wilkes Exp. 243.) — Central California to Utah, Montana, and British Columbia. (Asia.)

A. ursina. Root stout, ligneous: caudex very densely multicipital and bearing very close fascicles or rosettes of very short filiform-linear thickish glaucous glandular-ciliolate white-punctate apiculate leaves (but 2–3 lines in length): stems few, erect, branched, slender, finely glandular-pubescent, $1\frac{1}{2}$ –3 inches high, bearing one or two pairs of short distant spreading and rather rigid leaves: sepals nerveless: petals white, oblong, slightly emarginate: alternate filaments glanduliferous at the base: mature capsule considerably exceeding the calyx, about 6-seeded. — Dry hills, Bear Valley, San Bernardino Mts., *S. B. & W. F. Parish*, August, 1882. This species has much the habit of *A. compacta*, Coville, but much more obtuse sepals; it is most nearly related to *A. capillaris*, Poir., but differs in its condensed habit and in a waxy punctation of the leaves.

A. aculeata, WATS. Leaves grouped chiefly in fascicles at the summits of a multicipital caudex, decidedly glaucous, rigid and pungent and with age strongly spreading, 6–12 lines in length; cauline leaves few, shorter: stems simple up to the few-flowered cymes, 4–6 inches high: petals rather narrow, elliptic-oblancoolate, obtuse, $1\frac{1}{2}$ –2 times as long as the sepals. — Bot. King Exp. 40, & Bibl. Index, 94. — Chiefly in mountainous districts from Oregon (*Nevius*, *Cusick*, *Howell*) to N. Nevada (*Watson*), S. Utah, and Arizona(?). The sepals are variable and become more acute in the southern form, which is more difficult to distinguish from those varieties of *A. congesta* which have an open inflorescence.

← ← Sepals ovate, or ovate-lanceolate, acuminate, shorter than the petals (except in *A. macradenia*, var. *Parishiorum*).

A. compacta, COVILLE. Root thick, ligneous: caudex much branched and bearing very closely tufted rosulately spreading subulate glaucous leaves; the latter not exceeding 2 lines in length, minutely glandular, ciliate: stems slender, an inch or more in height, simple or sparingly branched, almost naked, the cauline leaves being few and much reduced: flowers terminal on the branches: sepals $1\frac{1}{2}$ lines long, scarious-margined, thickened in the middle, attenuate. — Proc. Biol. Soc. Wash. vii. 67; Contrib. U. S. Nat. Herb. iv. 70, t. v. — Mountains of Tulare Co., Calif., *Coville*, August, 1891.

A. congesta, NUTT. Smooth, or more rarely glandular-pubescent: stems slender, simple, 5–14 inches high, numerous, springing from a matted non-ligneous caudex: basal leaves gramineous-setaceous, $\frac{1}{2}$ –3 inches long, ciliolate-serrate near the base: cauline leaves rather distant, gradually reduced: flowers sessile or shortly and unequally pedicelled in 1–3 dense heads (subtended by 1–several pairs of scarious-margined bracts): sepals carinate, obscurely 3-nerved, membranous-margined, 2 lines long, considerably exceeded by the narrowly oblong petals: stigmas not strictly capitate. — Nutt. in Torr. & Gray, Fl. i. 178; Torr. Frem. Rep. 87; Wats. Bot. King Exp. 39; Porter & Coulter, Fl. Col. 13; Brew. & Wats. Bot. Calif. i. 69; Greene, Fl. Francis. 123 (excl. syn.); Mrs. Brandegee, Zoe, ii. 161. — Rocky Mts. of Colorado and Wyoming to the Yosemite (acc. *Mrs. Brandegee*) and northward to Washington, *Suksdorf*.

Var. *suffrutescens*. Caudex sometimes, perhaps always, very ligneous; its branches becoming 2–3 lines in diameter, bearing fascicled sub-equal leaves (an inch or less in length): flowers somewhat smaller (sepals $1\frac{1}{2}$ lines long) in spherical capitate umbels: pedicels slender, 2–3 times as long as the calyx: stigmas capitate. — *Brewerina suffrutescens*, Gray, Proc. Am. Acad. viii. 620, under *A. congesta*; Brew. & Wats. Bot. Calif. i. 69; Wats. Bibl. Index, 95; Greene, Fl. Francis. 123. — California, Cisco, *Bolander & Kellogg*; Emigrant Gap, *Jones*; Tulare Co., *Coville & Funston*, 1504. A form too well marked in its foliage, ligneous caudex, and allium-like inflorescence to be united with the typical *A. congesta*, yet appearing to intergrade with it. One of the transitional forms has been collected in Sierra Valley by *Lemmon*.

Var. *subcongesta*, WATS. Caudex more or less ligneous, stems smooth, glandular or pulverulent-pubescent, often knotted with enlarged nodes: flowers as in the type, but borne in more or less expanded di-

chotomous cymes: leaves varying greatly in length and texture. — Bot. Calif. i. 69; Bibl. Index, 454. *A. Fendleri*, var. *subcongesta*, Wats. Bot. King Exp. 40, & Pl. Wheeler, 6; Porter & Coulter, Fl. Col. 13; Rothr. Enum. Pl. Col. 35. *A. Fendleri*, var. *glabrescens*, Wats. Bot. King Exp. 40, & Bibl. Index, 95, differs only in its still looser inflorescence, and should doubtless be referred hither. — Rocky Mts. of Colorado and Arizona, *Newberry*, to British America, Cypress Hills, *Macoun*, westward to Oregon, *Howell*, and California, Sierra Co., *Lemmon*, Donner Pass, *Torrey*. These puzzling and inconstant forms are intermediate between this species and *A. capillaris*, *A. Fendleri*, and *A. macradenia*. From the last they scarcely differ save in their smaller flowers and slightly in the form of the petals.

A. macradenia, WATS. (revised). Glabrous or nearly so: rootstock more or less ligneous, extensively and irregularly branched: stems stout for the genus, 6–15 inches high, knotted with the enlarged nodes: leaves chiefly cauline, glaucous, rigid, pungent, $\frac{1}{2}$ –2 inches long: flowers larger than in the related species, in an open cyme: sepals fleshy subcarinate, $2\frac{1}{2}$ – $2\frac{3}{4}$ lines long, with membranous margins: petals considerably exserted, obovate or oblong with an obtusish sometimes auricled base: staminal glands moderately developed: stigmas subcapitate. — Proc. Am. Acad. xvii. 367 in part. — S. California, Mohave River, *Palmer*, 41; Antelope Valley, *Oliver*; S. Utah, *Parry*, 20, *Palmer*; Arizona, *Palmer*; Mt. Agassiz, *Lemmon*. These plants with their exserted petals and ligneous caudices best represent Dr. Watson's species as described, *Palmer's* no. 41 being the first mentioned type.

Var. (?) *Parishiorum*. Smooth or minutely glandular-pubescent: caudex scarcely ligneous, densely multicapitate: stems slender; nodes not conspicuously enlarged: leaves chiefly basal: petals narrowed at the base, shorter than or barely equalling the sepals, the latter fully 3 lines in length: staminal glands very large. — *A. macradenia*, Wats. l. c. xvii. 367 in part. — Common on mountains bordering on the Mojave Desert, *S. B. & W. F. Parish*, no. 1330.

+ + + Sepals lanceolate to lance-linear, attenuate, equalling or exceeding the petals.

+ + Flowers cymose, not densely aggregated.

A. Fendleri, GRAY. Rather pale and glaucous, finely glandular-pubescent above: stems numerous, erect, leafy, 4–15 inches high, closely aggregated upon the summit of a thick root: basal leaves setaceous, gramineous, ciliolate or quite smooth, 2–4 inches in length, somewhat pungent; the cauline gradually shorter, connate and sheath-

ing at the base: the internodes an inch or two long: inflorescence dichotomous, few to many flowered: sepals attenuate, glandular, nearly equalling the obovate petals ($2\frac{1}{2}$ –3 lines in length): capsule commonly a fourth shorter. — Pl. Fendl. 13; Torr. Pacif. R. Rep. iv. 69; Wats. Bot. King Exp. 40, exclusive of var. *glabrescens*; Porter & Coulter, Fl. Col. 13. — Chiefly in the Rocky Mts., but sometimes among the sage-brush of the plains. Nebraska, *Engelmann*; Colorado to New Mexico, *G. R. Vasey*; San Francisco Mts., Arizona, *Lemmon*; Los Angeles, Cal., *Nevin*. The var. *DIFFUSA* of Prof. Porter's Fl. Col. is a greener form from the Rocky Mts. of Colorado and Wyoming with a more lax and spreading inflorescence and often although not always larger flowers. It intergrades with the type, so that in herbarium specimens at least its separation is often unsatisfactory. A form collected by Prof. Porter in the Garden of the Gods, and possessing very small flowers (sepals $1\frac{1}{4}$ – $1\frac{1}{2}$ lines in length) upon curved and spreading branches, is perhaps equally worthy of varietal distinction.

→ → Flowers densely fasciated at the summit of the stem.

A. Franklinii, DOUGL. Caudex of numerous procumbent more or less elongated branches, covered with somewhat persistent dried leaves: stems quite smooth, erect, simple, 3–5 inches high, somewhat rigid but fragile, bearing 3–6 pairs of narrowly subulate pungent spreading smooth or ciliolate and minutely scabrous leaves (5–9 lines long): cymes dense, sub-involucrate: sepals elongated, attenuate, pungent with slightly spreading tips, 1-nerved, 4–6 lines long, distinctly exceeding the petals. — Hook. Fl. Bor.-Am. i. 101, t. 35; Torr. & Gray, Fl. i. 178; Torr. Bot. Wilkes Exp. 244. — Sandy soil, Oregon, *Douglas*, *Lyall*, *Howell*, *Nevius*, *Cusick*; Washington, *Suksdorf*. Specimens collected by *Douglas* at source of the Missouri may well have been the next species.

A. Hookeri, NUTT. Caudex densely multicapital: stems 1–4 inches high, pubescent: leaves shorter than in the last: flowers smaller and petals about equalling or slightly exceeding the sepals. — Nutt. in Torr. & Gray, Fl. i. 178. *A. Franklinii*, var. *minor*, Hook. & Arn. Bot. Beech. 326; Wats. Bibl. Index, 95; Coulter, Man. Rocky Mt. Bot. 35. *A. Franklinii*, Engelm. Trans. Am. Phil. Soc. n. ser. xii. 186; Coulter, l. c. 35 in great part; Hook. & Jackson, Index Kew. 179. — Rocky Mts., lat. 40°, *Nuttall*; Colorado, *Vasey*; Wyoming, *Hayden*, *Parry*, *Porter*, *Greene*, *Sheldon*; Plains of Green River, *Gray*; Nebraska, *Rydberg*, *Webber*; Montana, *Tweedy*. This species with much the habit of the preceding differs in its much denser caudex and constantly pubescent stem, as well as in the differences

indicated. The stem is terete even in a dried state, while the stems of *A. Franklinii* in drying become furrowed and angulate, as though slightly fleshy.

§ 5. *ALSINE*, Wahlenberg (as genus, not Linn.). Capsule ovoid, 3-valved; valves entire; seeds not strophiolate: matted perennials or delicate annuals, usually with narrow linear subulate or acerose leaves. — Fl. Lapp. 127; Fenzl in Ledeb. Fl. Ross. i. 341; Regel, Radde's Reisen in Ost-Sib. i. 337; Pax in Engl. & Prantl, Nat. Pflanzenf. iii. 1 b, 82.

* Palustrine perennial with weak elongated stems, narrow linear or lance-linear leaves and axillary long-peduncled flowers.

A. paludicola. Glabrous, flaccid: stems several, subsimple, procumbent, rooting at the lower joints, sulcate, shining, leafy throughout: leaves uniform, flat, 1-nerved, acute, spreading, $\frac{3}{4}$ –1 $\frac{1}{2}$ inches long, 1–3 lines in breadth, often punctate, somewhat connate, slightly scabrous upon the margins: peduncles solitary in the axils, 1–2 inches long, spreading or somewhat deflexed: sepals nerveless, not at all indurated, acutish about half the length of the obovate petals. — *A. palustris*, Wats. (not Gay). Bot. Calif. i. 70, & Bibl. Index, 97; Greene, Fl. Francis. 124; Mrs. Brandegee, Zoe, ii. 341. *Alsine palustris*, Kellogg, Proc. Calif. Acad. iii. 61. — Abundant in swamps about Fort Point near San Francisco, *Bolander*, *Kellogg & Harford*; also in swamps near San Bernardino, *Parish Bros.*; May to August.

* * Terrestrial annuals of the Atlantic Slope and Alleghany Mountains, rarely extending to the interior in the Southern States, essentially glabrous: sepals obtuse, soft in texture, scarcely or not at all nerved.

A. Grœnlandica, SPRENG. Somewhat fleshy: root at first simple, later of many delicate fibres: stems few to many, decumbent or erect, subsimple, 2–8 inches long, bearing 1–5 flowers: leaves linear, obtuse, 1 $\frac{1}{2}$ –7 lines long, at first in a dense, more or less rosulate cluster at the base; the cauline 2–4 pairs: sepals broadly ovate, 1 $\frac{1}{2}$ –2 lines in length: petals obovate, about twice as long, entire or notched: capsule subglobose to oblong, more or less contracted to a point. — Syst. ii. 402; Torr. & Gray, Fl. i. 180; Torr. Fl. N. Y. i. 95, t. 15. *A. glabra*, Torr. Fl. U. S. 455, not Michx.; Bigel. Fl. Bost. ed. 2, 180. *Alsine Grœnlandica*, Gray, Man. ed. 2, 58. *Stellaria Grœnlandica*, Retz. Fl. Scand. ed. 2, 107; Vahl, Fl. Dan. vii. t. 1210. ? *S. Labradorica*, Schrank, Pfl. Lab. 24; Meyer, Pl. Lab. 93. — Rocky soil, chiefly but not always at higher altitudes, Greenland to the coast of Maine, Bath, *Gambel*; Bar Harbor, *Rand*; also at Middletown, Conn., *Osborn*, *Wright*; locally abundant in the White, Green, Adirondack,

Catskill, and Shawangunk Mts.; reported from Kittatinny Mts. of N. W. New Jersey (*Britton*, Bull. Torr. Club, xi. 128), and recently found in the mountains of Pennsylvania (according to *Prof. Porter*), of S. Virginia (*Small & Heller*), and in N. Carolina (*Small*), where it had passed as a form of *A. glabra*, Michx., having been previously collected on Roan Mountain by *Gray & Carey, Smith, and Scribner*.*

A. glabra, MICHX. Glabrous, loosely matted, many-stemmed: stems weak, slender, suberect, very leafy, 6–12 inches high: leaves narrowly linear, spreading, thin, nerveless, equalling or exceeding the internodes: peduncles filiform, elongated, spreading, 1-flowered: corolla rather broad, considerably exceeding the calyx: sepals ovate-oblong, obtuse, nerveless, $1\frac{1}{2}$ lines in length, somewhat exceeded by the ovoid capsule. — Fl. i. 274; Torr. & Gray, Fl. i. 180 in part. *Alsine glabra*, Gray, Man. ed. 2, 58; Chapm. Fl. 49. — On rocks in mountains of N. Carolina, *Michaux*; Table Mountain, *Gray*; Table Rock, S. Carolina, *Vasey*; Stone Mt., Ga., *Gray*; De Kalb Co., Ga., *Small*; also in the Arroyo of Lamben, near the Mexican boundary, *Parry*.

A. brevifolia, NUTT. Glabrous: stems erect, filiform, 2–5 inches high, with spreading branches: leaves linear or lance-linear obtuse, nerveless, slightly fleshy, 1–4 lines long, commonly much shorter than internodes: sepals ovate-oblong, obtuse, only a line in length, with a distinct thin white margin: petals rather conspicuous, obovate, $2\frac{1}{2}$ – $3\frac{1}{2}$ lines in length, widely spreading: capsule ovoid, acuminate, a third longer than the calyx; valves ovate, acuminately narrowed almost to the tip. — Nutt. in Torr. & Gray, Fl. i. 180. *Alsine brevifolia*, Chapm. Fl. 49. — On rocks, Georgia, Tatnal County, *Nuttall*; Stone Mountain, *Canby, Gray, Small*; April, May. Apparently the most rare and local eastern species.

* * * Terrestrial annuals of the Pacific Slope: sepals neither indurated nor very strongly nerved.

— Seeds much flattened, and margined.

A. Douglasii, TORR. & GRAY. Thinly glandular-pubescent and somewhat viscid, or nearly glabrous: stems much branched, 2–15 inches high: leaves attenuate to filiform points: peduncles filiform: flowers numerous, larger than in the related species, 4–5 lines in diameter: sepals ovate, thin-margined, obscurely or more or less distinctly ribbed: petals obovate, conspicuous: capsule subglobose; the valves rounded at the apex; seeds large, smooth, or with fine radiate

* For further discussion of this species see page 328.

striation, reniform, broadly margined. — Fl. i. 674; Durand, Pl. Pratt. 83; Brew. & Wats. Bot. Calif. i. 69; Greene, Fl. Francis. 124. *A. verna*, β , Hook. & Arn. Bot. Beech. 325. *Greniera Douglasii*, Gay, Ann. Sci. Nat. ser. 3, iv. 27. *Alsine tenella*, Torr. Bot. Mex. Bound. 36 (ex char. et hab.). — Barren hillsides and grassy slopes, S. Arizona, Palmer, and S. California to Oregon, Howell, Henderson; some smaller flowered specimens with seeds of *A. Douglasii* have been collected by Thurber in San Diego, Calif.

+ + Seeds not flattened nor thin-margined.

A. Howellii, WATS. Finely glandular-pubescent: stem terete, purple, diffusely branched, more than a foot high: leaves rather thick, obtuse, 4–7 lines in length; the floral much reduced: flowers $2\frac{1}{2}$ –3 lines in diameter: petals oblong, little exceeding the ovate glandular nerveless sepals: capsule ovoid, pointed; valves narrowed to an acutish apex; seeds dark, slightly tuberculate-crested. — Proc. Am. Acad. xx. 354.

A. Californica, BREWER. Smooth: the delicate filiform stems branching from the base, erect, 2–4 inches in height: leaves very short, slightly fleshy, 1–2 lines in length, obtuse: flowers 4 lines in diameter: petals oblong, about twice the length of the ovate-oblong nerveless or inconspicuously ribbed sepals: seeds small, finely roughened. — Brewer in Boland. Cat. 6; Brew. & Wats. Bot. Calif. i. 69; Greene, Fl. Francis. 124. *A. brevifolia*, var. (?) *Californica*, Gray, Proc. Calif. Acad. iii. 101. — Dry hills, sandy soil. Central Calif. to Grant's Pass, Oregon, Howell.

A. pusilla, WATS. Smooth, very diminutive, $1\frac{1}{2}$ –2 inches high: stems purplish, filiform, branched from the base: leaves obtusish, but 1–2 lines in length: sepals not so strongly nerved as in the preceding, 1– $1\frac{1}{4}$ lines in length: petals minute or wanting: seeds minute, smooth. — Proc. Am. Acad. xvii. 367. *A. Californica* of Bot. Calif. (in part). — Plains about Yreka, Calif. (Greene), to the Dalles of the Columbia (Howell Bros.), and White Salmon, Wash. (Suksdorf).

* * * * Annuals or slender-stemmed loosely matted perennials, 5–15 inches in height: sepals lanceolate, acuminate or attenuate, strongly 3–5-nerved.

+ Puberulent.

A. tenella, NUTT. Finely glandular-pubescent: stems very slender, dichotomously branched almost from the base, 3–8 inches in height: leaves attenuate from a connate prominently ribbed base to a filiform often curved apex, 3–5 lines long; the uppermost considerably reduced: pedicels filiform, several times as long as the strongly

3-ribbed sepals; the latter equalled or more or less exceeded by the oblong petals: valves of ovoid capsule exceeding the sepals; seeds small, margined with a fine muriculate crest (under a strong lens). — Nutt. in Torr. & Gray, Fl. i. 179; Eaton & Wright, N. A. Bot. 133 (excl. Arkansas spec.); Macoun, Bot. Gaz. xvi. 286. *A. tenuifolia*, var. *Americana*, Fenzl ex Torr. & Gray, Fl. i. 674. *Greniera tenella*, Gay, Ann. Sci. Nat., ser. 3, iv. 27. *Alsine tenella*, Torr. Bot. Wilkes Exp. 243. — Rocky places, flowering in midsummer; Oregon, *Nuttall*, *Tolmie*, *Hall*, *Howell*, to British Columbia, Kamloops acc. to *Macoun*; Nanaimo, *Miss Cooley*. Like *A. Grænlantica* of the Eastern States, this species seems to occur either in mats or in a segregated state. In the former condition it considerably resembles *A. stricta*, Michx., but is to be distinguished by its small flowers and puberulent inflorescence. It differs from *A. patula* in its broadly elliptic petals not at all truncate or retuse.

A. patula, MICHX. Stem diffusely branched, 2 inches to a foot in height, often almost filiform: leaves spreading, slightly fleshy: inflorescence dichotomous; pedicels filiform, spreading: sepals lanceolate, attenuate, with 3–5 prominent converging nerves, slightly indurated, a little over 2 lines in length, usually minutely glandular: petals twice as long, entire or retuse, obcordate: the obtuse valves of the capsule about equalling the calyx; seeds black, minutely roughened. — Fl. i. 273; Torr. & Gray, Fl. i. 180; Gray, Man. ed. 5, 91; Hill, Bull. Torr. Club, xvii. 172; Macmillan, Bot. Gaz. xv. 332. *A. Pitcheri*, Nutt., and (?) *A. tenella*, Nutt. in Torr. & Gray, l. c., so far as Arkansas plants are concerned. *Alsine microsperma*, Fenzl ex Torr. & Gray, Fl. i. 674. *A. patula*, Gray, Man. ed. 2, 58; Chapm. Fl. 49. *A. Pitcheri*, Wood, Class-Book, 260; Chapm. Fl. (Suppl.) 608. *Stellaria macropetala*, Torr. & Gray, Fl. i. 184 (*Alsine macropetala*, Gray, Gen. ii. 34), differing only in the slightly more deeply divided petals, which are themselves more or less variable, must be referred hither, where its identity of habit and calyx clearly indicates its affinity to be. — Kentucky to Alabama (*Peters, Mohr*) and Texas (*Drummond, Meyer, Buckley*), northward to Chicago (*Babcock, Hill*) and Cass Co., Minnesota (acc. to *Macmillan*). The leaves of this species are variable, commonly narrowly linear or filiform, 4–7 lines in length, but they occasionally become $1\frac{1}{2}$ inches long and a line wide.

+ + Glabrous.

A. stricta, MICHX. Smooth, loosely matted: stems very numerous, slender, ascending, 3–15 inches high, leafy nearly to the middle: leaves subulate-setaceous, conspicuously fascicled in the axils: inflo-

rescence a loosely forked cymose panicle: petals narrowly obovate, nearly twice the length of the somewhat rigid acuminate prominently 3-ribbed sepals: capsule about equalling or exceeding the calyx. — Fl. i. 274; Ell. Sk. i. 521; Hook, Fl. Bor.-Am. i. 99, t. 33 (including both var. *a*, a weak boreal few-flowered form with erect leaves, and var. *β*, the common form with spreading leaves); Torr. & Gray, Fl. i. 179, var. *β*; Britton, Mem. Torr. Club, ii. 37. ? *A. setacea*, Muhl. Ind. Fl. Lanc. 169. *A. Michauxii*, Hook. f. Arc. Pl. 287, 322. *Alsine Michauxii*, Fenzl, Verbr. Alsin. 18; Regel, Ost-Sib. i. 351, t. 8, f. 1-5. — Rocky and gravelly soil, Vermont to S. Carolina, westward to Minnesota.

Var. Texana. More rigid, stems fewer, 3-7 inches high, strongly enlarged at the nodes: leaves very short, conspicuously connate; the fascicled ones but 1-2 lines long: flowers in a small rather dense cyme: sepals almost cartilaginous, very strongly 3-nerved, appearing attenuate through the infolding of their margins. — ? *A. stricta*, var. *a*, Torr. & Gray, Fl. i. 179. — Rocky Hills, Texas; along the Canadian River, *Gordon*, April, 1848; *Bigelow*, August, 1853; Dallas, *Hall*, July, 1872; Comanche Peak, *Reverchon*, 1881; Arkansas, *Leavenworth*; False Washita, Ind. Ter., *Palmer*; Kansas, Norton, *Smith*. Owing to its definite and limited geographic range this variety may, as Dr. Britton suggests, prove worthy of specific rank. The characters, however, are not very definite, and a specimen from Potosi, Mo. (*F. Peck*) exactly connects it with the type. While the description of Torrey and Gray's var. *a*, cited above, ill accords with the present plant and rather suggests that these authors intended their var. *a* to be equivalent to the var. *a* of Hooker, as their var. *β* was of his var. *β*, yet in the Columbia Herbarium there are specimens of the southwestern plant labelled in Torrey's hand as var. *a*. If the Texan plant was the var. *a* of Torrey and Gray, it need scarcely be said that it could not have been the typical form of Michaux's species, as it was doubtless intended to be.

* * * * * Perennials, closely matted or tufted, 1-6 inches in height: sepals acuminate, but not strongly nerved, except in *A. verna*.

A. verna, L. Rather closely tufted: stems numerous, slender, ascending or erect, smooth, 1-5 inches high, 1 to 3 (or more) flowered; the upper internodes commonly considerably exceeding the leaves: leaves linear-subulate, flat, rather strongly 3-nerved, usually erect and never squarrose: peduncles filiform: sepals ovate-oblong, acutish to acuminate, strongly 3-nerved, $1\frac{1}{2}$ - $1\frac{3}{4}$ lines long, exceeding the obovate or oblanceolate obtusish petals: capsule somewhat surpassing the

calyx. — Mant. i. 72; Seringe in DC. Prodr. i. 405; Hook. Fl. Bor.-Am. i. 99; Torr. & Gray, Fl. i. 181. *A. juniperina*, Pursh, Fl. 318; Hook. Fl. Bor.-Am. i. 98; Torr. & Gray, Fl. i. 179, 674. *Alsine verna*, Bartl. Beitr. ii. 63. — A widely distributed species with numerous but ill defined varieties. The smooth typical form appears to be common in the Rocky Mts. of British America (*Macoun*), and has been found on Mt. Albert, Lower Can. (*Allen*). A far more frequent form is

Var. *hirta*, Wats. Finely glandular-puberulent upon stems, peduncles, and calyx: leaves nearly or quite smooth. — Bot. King Exp. 41; Porter & Coulter, Fl. Col. 14; Rothr. Enum. Pl. Col. 35. *A. hirta*, Wormsk. Fl. Dan. x. t. 1646. *A. propinqua*, Richardson in Frankl. Journ. 738. *Alsine verna*, var. *hirta*, Fenzl in Ledeb. Fl. Ross. i. 349. *A. rubella*, var. *hirta*, Lange, Pl. Grœnl. 132. *A. propinqua*, Lange, Fl. Dan. xvii. t. 2903. *A. hirta*, Warming, Bot. Foren. Festskr. 1890, 229. — From Greenland to Alaska, southward to Smugglers' Notch, Vt. (*Pringle*), and along the Rocky Mts. to Arizona (*Lemmon*); also in the San Bernardino Mts. (*Wright*).

Var. *rubella*, Hook. f. Depauperate, minutely glandular-puberulent or very rarely smooth: peduncles and sepals purplish tinged, the latter less strongly nerved. — Journ. Linn. Soc. v. 82. *A. Giesekii*, Hornem. Fl. Dan. ix. t. 1518. *A. hirta*, var. *glabrata*, Cham. & Schlecht. Linnæa, i. 56. *Alsine rubella*, Schrenk in Fenzl, l. c. i. 349. *A. verna*, var. *glacialis*, Fenzl fide Wats. Bibl. Index, 99. — Occurring with and often scarcely to be distinguished from the preceding.

A. Rossii, RICHARDSON. Dwarf and closely tufted, glabrous: leaves crowded, narrowly linear, 3-edged, obtusish, slightly fleshy: stems many, $\frac{1}{2}$ – $1\frac{1}{2}$ inches long, filiform, usually ending in a solitary peduncle, more rarely branched and several-flowered: sepals attenuate, slightly fleshy, not at all rigid and scarcely or not at all ribbed, 1– $1\frac{1}{2}$ lines long: petals oblong, nearly equalling the calyx, often minute or none: capsule shorter than the calyx. — Richardson in Frankl. Journ. 738; R. Br. in Parry's 1st Voy. App. 272; Hook. Fl. Bor.-Am. i. 100; Torr. & Gray, Fl. i. 181; Porter & Coulter, Fl. Col. 14. *A. elegans*, Cham. & Schlecht. Linnæa, i. 57. *A. stricta*, Wats. Bibl. Index, 98, in part, not of Michaux nor Wahlenberg's *Alsine stricta* of the Old World, which is surely distinct. *Alsine Rossii*, Fenzl, Verbr. Alsin. 18. — Mountains of Colorado, *Hall & Harbour*, *Coulter*, *Wolf*; Wyoming, *Parry*; British America, *Bourgeau*, to Arctic America.

A. Nuttalli, Pax. Glandular-puberulent or tomentulose throughout: root single, vertical, rather stout: stems many, loosely matted and much branched near the base; branches ascending or erect, leafy:

leaves subulate-acerose, rigid, pungent, tending to be squarrosely spreading, connate, 3-4 lines long: flowers usually numerous in spreading cymes, rarely subsolitary: sepals attenuate, acuminate, often purplish, not strongly nerved, 2-2½ lines long, exceeding the more or less pointed petals and ovoid capsule. — Pax in Engler, Jahresb. xviii. 30. *A. pungens*, Nutt. in Torr. & Gray, Fl. i. 179 (not of Clem.); Wats. Bot. King Exp. 40. — Rocky Mts. from Wyoming to S. British America, westward in mountainous regions to Washington and S. California.

Var. gracilis. Sepals narrow, elongated and still more attenuate, 2½-3 lines long: leaves less rigid, scarcely spreading or pungent. — *A. pungens*, var. *gracilis*, Gray in herb. — California Mts. above Big Tree Grove, *Bolander*, 4976; Long Meadow, Tulare Co., *Palmer, Coville & Funston*. Intergrading with the typical form.

* * * * * Densely caespitose perennials with acicular or awl-shaped leaves: sepals oblong, or linear-oblong, very obtuse.

+ Alpine, boreal or arctic species.

++ Petals oblong or narrowly obovate.

A. Sajanensis, WILLD. Caespitose: stems finely but rather densely glandular-hirsute, decumbent, very leafy below and with age sheathed at the base with the dried persistent leaves; the upper more or less erect portion of the stems ½-2½ inches in length, bearing two or three pairs of short and rather distant more or less puberulent leaves, and terminating in 1 to 3 flowers; lower leaves linear, obtusish, rather rigid, erect, 2-3½ lines long, quite glabrous or ciliolate, less commonly glandular-pubescent, straight: segments of the calyx linear-oblong, 1-3-ribbed, glandular-pubescent, 2 lines in length: petals spatulate, equalling or half exceeding the sepals, rarely nearly twice as long (but narrower than in *A. arctica*): valves of the capsule linear-oblong, obtuse, often considerably exceeding the calyx. — Willd. in Schlecht. Berl. Mag. Natf. 1816, 200; DC. Prodr. i. 408. *A. thymifolia*, James, Cat. 181. *A. obtusa*, Torr. Ann. N. Y. Lyc. ii. 170. *A. biflora*, Wats. Bibl. Index, 94, not of Linn. *A. arctica*, and vars. of various authors, not of Stev. *Stellaria biflora*, L. Spec. 422. *Alsine biflora*, Wahlenb. Fl. Lappon. 128; Fenzl in Ledeb. Fl. Ross. i. 355. — Mt. Albert, Lower Can., *Allen, Macoun*, to Labrador and Behring Strait, southward to Oregon, *Cusick*, and along the Rocky Mountains to New Mexico, *Parry*, and Arizona, *Lemmon*. (Greenland and Siberia.) A common species widely distributed in alpine and arctic regions of the Old and New World. Its confluent varieties and forms seem largely due to individual environment. The follow-

ing only need be mentioned : var. *RIGIDULA* (*Alsine biflora*, var. *rigidula*, Fenzl, l. c.), with leaves erect, firm in texture and rather closely imbricated ; and var. *CARNOSULA* (*Alsine biflora*, var. *carnosula*, Fenzl, l. c.), more flaccid, with leaves spreading and slightly fleshy.

? *A. laricifolia*, L. Slightly woody and much branched at the base : stems clothed with linear acicular second ciliolate-denticulate leaves : fertile branches erect, simple, 4-7 inches in height, 2-5-flowered : sepals $3\frac{1}{2}$ lines in length, linear-oblong, 3-nerved : petals oblong or narrowly obovate, entire, twice as long as the calyx. — Spec. 424. — An alpine European species at various times reported from Alaska but still somewhat doubtful. Plants recently collected upon the Porcupine River by *J. H. Turner* certainly possess much resemblance to the European plant, but differ in their shorter sepals and less leafy stems. It is not unlikely that they may prove merely a tall and long-petalled form of the preceding polymorphous species.

++ ++ Petals broadly obovate, much exceeding the calyx : Alaskan.

A. arctica, STEV. Stems 1-3 inches long, glandular-pubescent : lower leaves narrow, linear, obtuse, slightly fleshy, crowded upon the bases of the stems, nearly or quite glabrous, sometimes slightly ciliated near the base, half a line in breadth ; the upper leaves a little broader, and more or less distant : flowers solitary, terminal upon slender glandular-pubescent peduncles, 5-7 lines in diameter : capsule $3\frac{1}{2}$ -4 lines long, considerably exceeding the sepals : seeds minutely roughened and slightly crested. — Stev. in DC. Prodr. i. 404 ; Cham. & Schlecht. Linnæa, i. 54 ; Hook. Fl. Bor.-Am. i. 100 (excl. vars.) ; Torr. & Gray, Fl. i. 181 in part. *Alsine arctica*, Fenzl, Verbreit. Alsin. 18, & Ledeb. Fl. Ross. i. 355 ; Regel, Ost-Sib. i. 338, 346 (excl. var. *breviscapa*). — Western and Northern Alaska and adjacent islands.

A. macrocarpa, PURSH. Stems 2-4 inches long, covered except near the ends with the densely imbricated lance-linear obtuse conspicuously ciliated leaves ; the latter $\frac{3}{4}$ of a line broad : flowers solitary, terminal, often exceeding $\frac{1}{2}$ inch in diameter : valves of the mature capsule fully 6 lines in length ; seeds slightly margined. — Fl. 318 ; Cham. & Schlecht. Linnæa, i. 55 ; Hook. Fl. Bor.-Am. i. 101 ; Torr. & Gray, Fl. i. 182, 675. *A. arctica*, var. β , *grandiflora*, Hook. Fl. Bor.-Am. i. 100, t. 34, f. B. *Alsine macrocarpa*, Fenzl, Verbreit. Alsin. 18 ; Regel, Ost-Sib. i. 354, t. 8, f. 6-9 ; *A. arctica*, var. *breviscapa*, Regel, l. c. i. 347. Regel's elaborate subdivision of the Siberian forms of this species is not warranted in America in the absence of abundant fruiting material. — Western Alaska near the coast. (Siberia.)

+ + Species of the Atlantic and Gulf States, neither arctic nor alpine.

A. Caroliniana, WALT. Stems several to many, glandular-pubescent and viscid above. 3–8 inches in height, densely leafy near the base: leaves linear-subulate, rigidulous, pungent, triangular in section, channelled above; the lower imbricated and more or less squarrosely spreading; the upper reduced, distant: cymes few-flowered; pedicels slender, ascending: sepals oval, $1\frac{1}{2}$ lines in length: petals broad, rounded at the apex. — Car. 141; Wats. & Coulter in Gray, Man. ed. 6, 85. *A. squarrosa*, Michx. Fl. i. 273; Ell. Sk. i. 520; Torr. Fl. N. Y. i. 95. *A. imbricata*, Raf. in Desv. Journ. Bot. (1808), i. 229. *A. Rafinesquiana*, Seringe in DC. Prodr. i. 409. *Alsine squarrosa*, Fenzl ex Gray, Man. ed. 2, 57; Gray, Gen. ii. 34, t. 111; Chapm. Fl. 49. — Pine barrens, S. New York to Florida.

12. SAGINA, L. PEARLWORT. (Name from the Latin *saginare*, to fatten; the plants though small and delicate sometimes grow abundantly in otherwise barren regions and are grazed by cattle.) Low slender herbs commonly cespitose with filiform stems and subulate or filiform leaves; about a dozen species inhabiting the temperate and frigid parts of the northern hemisphere; one being also widely distributed in the southern hemisphere. — Gen. n. 336; DC. Prodr. i. 389; Gray, Gen. ii. t. 109.

* Very slender, 2–5 inches high: the almost capillary stems several to many, subsimple from near the base, usually several-flowered: the lowest flowers distinctly axillary: leaves nearly filiform but flattened above, not proliferous in the upper axils nor forming sterile lateral rosettes; the basal rosette seldom persisting: flowers very small, 4- or 5-parted.

S. apetala, L. Very slender and commonly glandular-pubescent: stems not numerous, procumbent or nearly erect: leaves very slender, $1\frac{1}{2}$ –3 or 4 lines in length, scarcely flat: pedicels straight; flowers normally 4-parted; petals obovate. — Mant. ed. 2, 559; Fenzl in Ledeb. Fl. Ross. i. 338; Torr. & Gray, Fl. i. 177. *S. procumbens*, var., Benth. Brit. Fl. 120. — Labrador, *Allen*, to Pennsylvania, infrequent but locally abundant in dry situations. A form with elongated capillary stems is abundant in grassy situations near Hewitt's, Bergen Co., N. J., *Britton*. Introduced at Auburn, California, *Mrs. Ames*. *Alsinea ciliata*, Greene, which is ambiguously characterized in the Flora Francis. 126, as a very slender and diffuse plant of compact habit, does not differ in its described characters from this species.

S. decumbens, TORR. & GRAY. Annual, quite smooth or the younger parts slightly glandular: stems several, decumbent or sub-

erect, 2–5 inches high, subsimple: the filiform straight peduncles exceeding the narrowly linear very acute leaves: flowers normally 5-parted: calyx appressed even in fruit, obtusish but not rounded at the base, $\frac{2}{3}$ the length of the capsule valves: petals scarcely equalling the sepals: stamens 10. — Fl. i. 177. *S. procumbens*, Pursh. Fl. 119. *S. Elliottii*, Fenzl ex Gray, Man. ed. 2, 61. *S. subulata*, Torr. & Gray, Fl. i. 178, not of Wimm. ? *Spergula nodosa*, Walt. Car. 142. *S. saginoides*, Michx. Fl. i. 276, not of Linn. *S. decumbens*, Ell. Sk. i. 523. *S. subulata*, Hook. Fl. Bor.-Am. i. 93. — New England to Great Plains of British America (*Macoun*), southward to Florida and Texas; on dry, sandy ground.

Var. *Smithii*, WATS. More slender: flowers apetalous, at least all the later ones. — Bibl. Index, 105; Wats. & Coulter in Gray, Man. ed. 6, 89. *S. subulata*, var. *Smithii*, Gray, Man. ed. 5, 95. Unsatisfactorily distinguished from *S. apetalata* by its 5-parted flowers.

S. occidentalis, WATS. Annual, glabrous, with habit and foliage of the preceding species but with longer pedicels (usually 7–10 or 12 lines) and larger also 5-parted flowers: capsule $1\frac{3}{4}$ lines in length: calyx rounded at the base. — Proc. Am. Acad. x. 344. *S. procumbens*, Boland. Cat. 6; Torr. Bot. Wilkes Exp. 242? *S. Linnæi*, Gray, Proc. Am. Acad. viii. 378. *Alsinella occidentalis*, Greene, Fl. Francis. 125. — Vancouver's Island to Southern California, low grounds and salt marshes of the coast. The western equivalent of *S. decumbens*, possibly intergrading with that species.

S. procumbens, L. Matted: the numerous procumbent leafy stems $1\frac{1}{2}$ –4 inches in length: leaves smooth or ciliate, narrowly linear, obtusish and mucronate: pedicels filiform elongated, nodding at the summit during anthesis: flowers normally 4-parted: petals considerably shorter than the sepals; the latter spreading in fruit. — Spec. 128; Torr. & Gray, Fl. i. 177. — Moist rocks, also in paths, etc., Nova Scotia to Pennsylvania, also rarely inland as far as Michigan, *Hill*; flowering through the summer. (Eu., Asia, S. Amer.) Apetalous forms have been noted in the Old World.

* * Stems very short, $\frac{1}{2}$ –2 inches long; flowers rather small, 5-parted, terminal: leaves thickish, narrowly linear to subulate, not proliferous in the upper axils but almost always forming lateral sterile rosettes about the base.

S. Linnæi, PRESL. Matted, 1–3 inches high: stems slender, decumbent, rooting and often producing lateral rosettes: radical leaves narrowly linear, acutely mucronate, 3–7 lines long, forming dense and mostly persistent rosettes; cauline leaves short, few: pedicels long, filiform, commonly recurved at the summit: flowers moderately large

for the genus: petals not quite equalling the calyx: capsule ovate, conic, even before dehiscence considerably exceeding the sepals; the dry valves fully twice their length: stamens 5-10. — Rel. Haenk. ii. 14; Fenzl in Ledeb. Fl. Ross. i. 339; Wats. Bot. King Exp. 41. *S. saxatilis*, Wimm. in Lange, Pl. Grœnl. 133. *Spergula saginoides*, L. Spec. 441. *Alsinella saginoides*, Greene, Fl. Francis. 125. — Labrador, Allen, to Greenland, Alaska southward along the Rocky Mts. to New Mexico; also in Mariposa Co., Calif., Congdon.

S. nivalis, LINDBL. Very condensed, $\frac{1}{2}$ -1 inch high: leaves subulate, or linear subulate, 2-3 (rarely 5) lines long, forming one or more dense rosettes; cauline leaves few and short: pedicels spreading, 5 lines in length, straight or curved but scarcely ever hooked at the summit: petals equalling the purple edged sepals, about a line in length. — Bot. Not. 1845, 66; Hook. f. Arc. Pl. 287, 322; Babington, Seem. Journ. Bot. ii. 340; Wats. Bot. King Exp. 42. *S. intermedia*, Fenzl, l. c. i. 339. *Arenaria cœspitosa*, Vahl, Fl. Danica, xiii. t. 2289. — A rare plant, first collected in America by Dr. Watson in the Uinta Mts. in 1869 (Herb. Dep't of Agric.); since found in Alaska, without the exact locality, Dall; Kyska Harbor, Harrington; and also in the Rocky Mts. of Colorado near Gray's Peak, Patterson. The species has been regarded by some authors, and perhaps rightly, as a boreal or high alpine form of the preceding.

* * * Distinctly fleshy: stems not filiform, more or less branched, several-flowered: flowers 5-parted: species of the Pacific coast.

S. crassicaulis, WATS. Smooth: stems several or many, branching, $1\frac{1}{2}$ -5 inches long: leaves linear, pungent, thickish, $2\frac{1}{2}$ -7 (rarely 12) lines long; the basal forming a rosette which may persist or not; the cauline connate by broad scarious membranes: pedicels numerous, straight: petals and sepals subequal, $1\frac{1}{2}$ lines in length: capsule $\frac{1}{3}$ - $\frac{1}{2}$ longer. — Proc. Am. Acad. xviii. 191. *Alsinella crassicaulis*, Greene, Fl. Francis. 125. — Beaches of Pacific coast, Marin Co., Calif., Congdon; Monterey Co., Michener & Bioletti; Ilwaco, Washington, Henderson. Distinguished from the Japanese *S. maxima*, Gray, by its glabrous peduncles and calyx.

* * * * Stems simple, 2-6 inches in length; upper leaves short, proliferous, i. e. bearing fascicles of minute leaves in their axils: flowers 5-parted: petals exceeding the calyx: species of the Atlantic Slope and Great Lakes.

S. nodosa, FENZL. Perennial: stems several to many, decumbent, rooting at the base, often 5-6 inches in length: lower leaves filiform; the upper subulate, only a line in length, bearing a tuft of undeveloped leaves in the axils, thus giving a nodose appearance to

the slender stems: flowers terminal, large for the genus, 4 lines in diameter when expanded. — Verbr. Alsin. t. 18, & Ledeb. Fl. Ross. i. 340. *Spergula nodosa*, L. Spec. 440. — Moist sandy soil. Coast of Maine south to Cape Ann, *J. Robinson*; also on both shores of Lake Superior and northward to Hudson Bay.

13. **SPERGULARIA**, Pers. (Name, a derivative of *Spergula*.) Annuals or perennials, usually of maritime and saline habitat, with narrowly linear, often fleshy leaves. A genus of moderate size but difficult, through the natural variability of certain species, the inconsistency of characters (such as the form of the seeds) which elsewhere are most trustworthy, and finally through an unfortunate complication in the synonymy, arising both from the most diverse views as to the number and proper limitation of the species and from the differences in the choice of the generic name. Space does not here permit any complete discussion of the last point. It may, however, be said that the name *Spergularia* is the only one which has ever attained a wide use, having been employed in such excellent popular manuals as Hooker & Bentham's Handb. Brit. Fl., Hooker's Fl. Brit. Isl., Garcke's Fl. Deutsch., Gray's Man., eds. 1-5, Cosson & Germain's Synop. Analyt., etc. Beside this matter of popular usage of the past, there is at present the best authority for selecting this name, since it is the one retained by the Kew botanists, and is advocated in the Berlin recommendations. On the other hand, the more radical reformers of nomenclature have attained no unanimity in regard to the proper name for the genus; Professors Baillon, Greene, and Britton adopting *Tissa*, Dr. Kuntze *Buda*, and Mr. N. E. Brown *Corion*, while Prof. Pax, who in his Monograph of the Caryophyllaceæ in Engler & Prantl's Nat. Pflanzenf. used *Tissa*, in a later publication has returned to *Spergularia*. — Syn. i. 504; Gray, Gen. ii. 27, t. 108; Benth. & Hook. Gen. i. 152. *Arenaria*, L. Gen. n. 374 in part. *Corion*, Mitchell, Act. Phys. Med. Acad. Nat. Cur. viii. App. 218, fide Britton in Britten's Journ. of Bot. xxix. 303; N. E. Brown, Suppl. Eng. Bot. *Tissa*, Adans. Fam. des Pl. ii. 507; Baillon, Hist. des Pl. ix. 116; Britton, Bull. Torr. Club, xvi. 125; Greene, Fl. Francis. 126, & Man. Bay Reg. 35. *Buda*, Adans. l. c. i. 507; Dumort. Fl. Belg. 110; Wats. & Coulter in Gray, Man. ed. 6, 89. *Lepigonum*, Fries, Fl. Hall. 76; Kindberg, Monogr.; Wats. Bibl. Ind. 103.

* Procumbent, or decumbent, slender, scarcely at all fleshy, growing near or even on the seacoast, but not truly saline: flowers small or of medium size: petals magenta: stipules lanceolate, elongated and conspicuous.

S. rubra, PRESL. Usually annual, smoothish below, finely glandular-pubescent above: stems spreading, wiry: leaves flat above, nar-

rowly linear, cuspidate, 4–6 lines long, $\frac{1}{3}$ – $\frac{1}{2}$ line broad: stipules white, attenuate, 2–3 lines long: inflorescence racemiform; pedicels truly filiform, exceeding the bracts and about twice as long as the oblong-lanceolate scarious-margined acutish glandular-pubescent sepals: corolla $1\frac{1}{2}$ lines in diameter, scarcely equalling the calyx: capsule of the same length; seeds “semiobovate” and minutely crested but not winged. — Rel. Haenk. ii. 9; Gray, Gen. ii. 28, t. 108, & Man. ed. 1, 64 excl. var. *S. rubra*, var. *campestris*, Gray, Man. ed. 5, 95. *S. campestris*, Aschers. ex Rohrb. in Mart. Fl. Bras. xiv.² 267. *Arenaria rubra*, L. Spec. 423 excl. var.; Bigel. Fl. Bost. 108; Hook. Fl. Bor.-Am. i. 98. *Buda rubra*, Dumort. Fl. Belg. 110. *Spergula rubra*, Torr. & Gray, Fl. i. 175 excl. vars. *Tissa rubra*, Britt. Bull. Torr. Club, xvi. 127. — An attractive species, growing about paths in dry sandy soil. Maine to Virginia, and Washington State, *Suksdorf*; to San Francisco, *Mrs. Brandegee*. (Europe.)

S. Clevelandi. Perennial, viscid-glandular: leaves ascending, often second, conspicuously fascicled in the axils, almost terete and filiform, very acute and attenuate, 5–10 lines in length: flowers much as in the last, but often somewhat larger: seeds winged. — *Tissa villosa*, Britton, l. c. xvi. 129. *T. Clevelandi*, Greene, Fl. Francis. 127. *T. rubra*, K. Brandegee, Zoe, iv. 84. — Sandy soil, California, San Diego, *Cleveland*, *Mrs. Brandegee*; San José, *Mrs. Bush*; and at the Presidio, San Francisco, according to *Prof. Greene*. A doubtful species with close affinities, as *Mrs. Brandegee* suggests, to *S. rubra*, but not readily identifiable with any form of that species, as it seems to differ in its longer, more terete and acute leaves, and winged seeds. From the South American *S. villosa* it differs in its lower growth, distinctly smaller flowers, shorter pedicels, and somewhat firmer and less flaccid leaves.

* * Slender spreading or erect annuals of the West and Southwest, scarcely fleshy, and with short deltoid stipules.

— Corolla pink (or white?) more than half as long as the sepals.

S. diandra, Boiss. Viscid-pubescent to nearly glabrous: leaves not fascicled, linear-filiform: pedicels slender, about 2 lines long, spreading or deflexed: sepals in fruit $1\frac{1}{2}$ lines long, but little exceeded by the capsules: stamens usually but 2–3. — Fl. Orient. i. 733. *Arenaria diandra*, Guss. Prodr. Sic. i. 515. *Tissa diandra*, Britton, Bull. Torr. Club, xvi. 128. — Texas, *Drummond*, *Lindheimer*, Goshen, Calif., *Mrs. Brandegee*, Oregon, *Henderson*, and on sandy banks of the Columbia River in Klickitat Co., Washington, *Suksdorf*. In its wiry procumbent stems this species also suggests *S. rubra*, from which, however, it differs in its short deltoid stipules.

S. gracilis. Low, glabrous, 2-6 inches in height, diffusely branched: leaves $\frac{1}{3}$ -1 inch in length: stipules deltoid: flowers small, subglobose, 1-1 $\frac{1}{4}$ lines in diameter, not closely aggregated; pedicels 2-3 lines long: sepals elliptic ovate, a line or less in length, thick in the middle but scarious-margined: valves of the capsule a third to a half longer than the sepals; seeds angled, somewhat triangular in outline, finely but distinctly roughened. — *Lepigonum gracile*, Wats. Proc. Am. Acad. xvii. 367. *Tissa gracilis*, Britton, Bull. Torr. Club, xvi. 128. — Sandy ground, dried ponds, etc. Dallas, Texas, *Reverchon*, to S. California, *Parry*, *Nevius*, *Orcutt*.

S. tenuis. Dichotomously much-branched, becoming 8-10 inches in height, somewhat glandular-puberulent or pubescent above: leaves 6-10 lines long: the very numerous flowers somewhat larger than in the last and inclined to be closely grouped; capsule twice the length of the ovate-oblong sepals. — *Lepigonum tenue*, Greene, Pittonia, i. 63. *Tissa tenuis*, Greene ex Britton, Bull. Torr. Club, xvi. 128. *T. diandra*?, K. Brandegee, Zoe, iv. 84. — California near Alameda, *Greene*, Mt. Eden and Tulare, *Mrs. Brandegee*. The affinities of this species are almost equally with *S. salina*, Presl, and *S. diandra*, Boiss., and in a large series of specimens it may not be possible to distinguish it sharply from either. The flowers, however, are more numerous and smaller and the corolla less developed than in the former; the habit also is much more branching. From *S. diandra* it differs in the usually much shorter pedicels of the closely aggregated and at first subcorymbosely arranged flowers.

* * * Annuals or biennials, more decidedly fleshy, usually of maritime or saline habitat: flowers small or of medium size: corolla more or less conspicuous, white or pink, less frequently pink-purple: stipules ovate or deltoid.

S. salina, PRESL. Commonly although not always pubescent: leaves often fascicled in the axils: sepals ovate to oblong-lanceolate, narrowed upward although obtuse at the summit, 2-2 $\frac{1}{2}$ lines long: petals pink: capsule equalling or a third to a half longer than the calyx: seeds turgid, obovate, usually roughened, less frequently nearly or quite smooth (var. *leiospermum*, N. E. Brown, Eng. Bot. Suppl.). — Fl. Cechica, 95; Gray, Man. ed. 5, 95; Warming, Bot. Foren. Festkr. 1890, 238, fig. 20. *S. Canadensis*, Don, Mill. Dict. i. 426. *S. rubra*, var. *marina*, Gray, Man. ed. 1, 64. *S. media*, and var. *macrocarpa*, Gray, Man. ed. 5, 95. *Arenaria rubra*, var. *marina*, L. Spec. 423. *A. marina*, Bigel. Fl. Bost. 109; Roth in Hornem. Fl. Dan. xiii. t. 2231. *Buda marina*, Dumort. Fl. Belg. 110. *Lepigo-*

num salinum, Fries, Mant. iii. 34. *L. marinum*, Kindberg, l. c. 18. *L. medium*, Wats. Bibl. Index, 103 in part. *Tissa marina*, Britton, l. c. xvi. 126. — Common on both the Atlantic and Pacific coasts, also occurring upon the Gulf coast, and not infrequent about salt lakes and in alkaline regions of the interior, especially westward.

Var.? *minor*. Smaller, 2-3 inches high: flowers smaller and very numerous, on short pedicels ($\frac{3}{4}$ -2 lines in length) and consequently rather densely aggregated. — *Buda marina*, var.? *minor*, Wats. in Gray, Man. ed. 6, 90. — Coast of New Hampshire and Massachusetts. An ambiguous form suggesting the western *S. tenuis* but smaller and with a better developed corolla.

S. borealis. More slender and in well developed specimens more diffusely branched than the preceding, 2-5 inches high, glabrous: leaves opposite, seldom fascicled; stipules ovate, broader than long, obtuse or obtusish: sepals ovate, 1-1½ lines long, very obtuse: petals shorter, white or pink: capsule ovate-oblong, usually nearly or quite twice as long as the calyx; seeds usually wingless and nearly or quite smooth. — *Arenaria rubra*, β , Michx. Fl. i. 274. (Dr. Britton, who has examined the type of Michaux's variety, pronounces it identical with this species.) *A. Canadensis*, Pers. (Syn. i. 504), the oldest specific name, but not to be selected for use under *Spergularia*, since *S. Canadensis* has been used by Don (Mill. Dict. i. 426) for a "pilose" and "rather hispid" plant, extending from "Canada to Carolina" and being doubtless *S. salina*, Presl; *Lepigonum medium*, Wats. Bibl. Index, 103 in part. *Tissa salina*, Britt. l. c. xvi. 127. *Buda borealis*, Wats. & Coulter, in Gray, Man. ed. 6, 90. — Sea-beaches and tidal marshes, Maine to Labrador.

* * * * Stout and fleshy perennials of the Pacific slope: flowers large.

S. macrotheca. Smooth to densely glandular-tomentose: stems spreading, ascending, 8-15 inches in height; leaves linear, acute, mucronate, 8 lines to 2 inches in length, about a line in breadth; internodes more or less developed, usually $\frac{1}{2}$ -1 inch long: floral bracts resembling the leaves: inflorescence inclined to be racemiform; pedicels 4-12 lines in length, spreading or more or less deflexed: sepals lanceolate, acutish or somewhat attenuate to an obtuse point, thick in the middle, nearly smooth or viscid-glandular, conspicuously membranous-margined: petals roseate, shorter than the sepals: capsule oblong-ovoid, acutish, nearly equalling the sepals. — *Arenaria macrotheca*, Hornem. ex Cham. & Schlecht. Linnæa, i. 53. *Lepigonum macrothecum*, Fisch & Mey. Ind. Sem. Petr. iii. 14; Kindberg, Monog. 16, t. 1, f. 1; Wats. Bibl. Index, 103. *L. Chilense*, Fisch &

Mey. l. c. *Spergularia rubra*, Torr. Pacif. R. Rep. iv. 70. — California, chiefly on or near the coast. A polymorphous species, the varieties of which, although diverse in aspect, appear in a large series of specimens to be thoroughly connected by intermediates.

Var. *leucantha*. Erect or nearly so, with long internodes: leaves somewhat narrower and more erect than in the type: floral bracts reduced and inflorescence more distinctly cymose; pedicels elongated, rather rigidly spreading or deflexed: corolla white, nearly 6 lines in diameter. — *Tissa leucantha*, Greene, Fl. Francis. 127. — A variety of alkaline regions of the interior. A form from Vanden (*Mrs. Brandegee*), identical in habit and foliage, has magenta flowers.

Var. *scariosa*. Low, pale, smoothish near the base, and often very glandular-viscid above, densely leafy; the internodes scarcely or not at all developed: leaves $\frac{1}{3}$ – $\frac{1}{2}$ inch long, acute; stipules conspicuous, ovate-lanceolate, acuminate, 4–5 lines long: inflorescence racemiform; pedicels not greatly exceeding the calyx. — *Tissa macrotheca*, var. *scariosa*, Britton, Bull. Torr. Club, xvi. 129. *Tissa pallida*, Greene ex Britton, l. c. xvi. 129; Fl. Francis. i. 127. — Coast at Monterey, California, *Torrey*; *Hooker & Gray*, 1877; *Gray*, 1885; and at Fort Point, *Brandegee*. *Tissa valida*, Greene, Erythea, i. 107, appears to be a firmer and more erect form of the same thing, also pale and very viscid, but with more elongated internodes and distinctly dichotomous cymose inflorescence. — Island of Santa Cruz, according to Professor Greene.

SPERGULA, L. SPURRY. (Name from the Latin *spargere*, to strew, in reference to the scattering of the numerous seeds.) — Annuals with narrowly linear slightly fleshy apparently whorled leaves; one species common in America, having probably been introduced with grain from the Old World. — Gen. n. 375; Reichb. Iconogr. vi. t. 511–513.

S. ARVENSIS, L. A foot or two high: leaves numerous in rather remote whorls: inflorescence a terminal naked spreading cymose panicle; pedicels often deflexed in fruit: petals white, equalling or slightly exceeding the sepals, 2–2½ lines long: capsule ovate-globose; seeds black minutely roughened with light-colored papillæ, acutely edged but scarcely winged. — Spec. 440; Walt. Car. 142; Eng. Bot. xxii. t. 1535; Pursh, Fl. 320; Hook. Fl. Bor.-Am. i. 92; Torr. & Gray, Fl. i. 174; Rothr. Pl. Alask. 444. *S. ramosissima*, Dougl. ms. according to Torr. & Gray, l. c. — Grain fields and cultivated grounds, common, United States and Canada, northward to Alaska. (Introduced from the Old World.)

II. — DESCRIPTIONS OF NEW AND HITHERTO IMPERFECTLY KNOWN PLANTS COLLECTED IN MEXICO BY C. G. PRINGLE IN 1892 AND 1893.

ERIODENDRON TOMENTOSA. Branchlets and petioles fuscous-tomentose; leaves 7-foliate; leaflets narrowly lanceolate, acuminate in both directions, sharply and finely serrate, sparingly hirsute upon the veins above, fuscous-tomentose beneath especially along the midrib, attenuate at the base to short scarcely distinct very tomentose petiolules: common petiole 2-3 inches long; stipules subulate, tomentose, persistent: peduncles short, thick: calyx turbinate-campanulate, $1\frac{1}{2}$ - $1\frac{3}{4}$ inches long, finely tomentose on the outer surface, densely woolly within; teeth rounded, a fourth as long as the tube: petals red, linear-oblong, spreading, rounded at the apex, over 5 inches in length, 4-5 lines in breadth, silky-pubescent upon the outer surface, less pubescent or glabrate within: staminal tube 8 lines long, hirsute; free portion of the filaments spreading, exerted from the corolla; anthers anfractuose. — Collected on a barranca near Guadalajara, June, 1892 (no. 5300). This species is distinguished from *Eriodendron æsculifolia*, HBK., by its tomentose branchlets and foliage. The latter species is apparently represented by Mr. Pringle's no. 5324, from hills bordering on Lake Cuitzea, Michoacan, August, 1892, which accords in every regard with Kunth's description save that the leaflets range from 5 to 7 instead of 7 to 8. It differs, however, from Mocino and Sesse's Plate 94 in the Calques des Dessins, in having a glabrous calyx, and stamens really shorter than the petals; leaflets a little broader and distinctly petiolulate. As the plate shows the calyx to be pubescent and foliage as in *E. tomentosa*, it appears probable that it was not drawn from *E. æsculifolia*, as hitherto supposed, but really represents a distinct species, probably the *E. tomentosa* just described.

AYENIA GLABRA, Wats. The following additional characters may be given: fruit subglobose, shallowly 3-lobed, nearly 4 lines in diameter, light green, muricately roughened with darker colored points; seeds dull brown, strongly rugose. — Collected in the barranca of Tequila, 2 and 17 October, 1893 (no. 4576).

BURSERA PRINGLEI, Wats. (Proc. Am. Acad. xxv. 145). This species was described from fruiting specimens. Mr. Pringle's no. 4381, collected on lava beds near Zapotlan, 27 May, 1893, shows the following additional characters: staminate flowers yellowish green: sepals 5,

ovate, acute, $\frac{1}{2}$ line in length: petals 2 lines long, with involute margins: stamens 10; anthers linear-oblong, twice the length of the filaments: disk deeply crenate.

NISSOLIA CONFERTIFLORA, Wats., var. *LAXIOR*. Agreeing with the type in foliage and technical characters, but having flowers nearly twice as large ($3\frac{1}{2}$ –4 lines in length) upon more elongated pedicels. — Collected in the barranca of Beltran, 5 June, 1893 (no 4379).

ÆSCHYNOMENE AMORPHOIDES, Rose in litt. *Brya* (?) *amorphoides*, Wats. (Proc. Am. Acad. xxii. 406). Excellent flowering and fruiting specimens of this plant, collected by Mr. Pringle in the barranca of Tequila, 1 October, 1893 (no. 4613), fully confirm the view expressed in a letter from Dr. J. N. Rose, that it should be referred to the genus *Æschynomene*. The staminal tube early splits on the ventral or lower side, and the pods are in all respects those of an *Æschynomene*.

CLITORIA (?) *SERICEA*, Wats. (Proc. Am. Acad. xxii. 407). Additional specimens collected on rocky hills near Guadalajara, June and July, 1893 (no. 4449), show the flowers of this species not hitherto described. Calyx short, campanulate, silky-villous, with narrow acuminate spreading teeth equalling the tube: corolla light blue, villous upon the outer surface, 6–7 lines long; petals subequal in length; the standard erect, open, orbicular, slightly thickened at the insertion of the claw; alæ oblong, abruptly contracted to a short claw: style bearded upon the upper surface: stamens all united. — An anomalous plant with the calyx rather of *Centrosema* but the bearded style and other characters of *Clitoria*.

CALOGANIA PULCHELLA, HBK., var. *RACEMOSA*. Leaflets broadly ovate, acutish: all or nearly all of the flowers borne in leafless axillary racemes (4–6 inches in length). — Collected by Dr. Edward Palmer at Tequila, Jalisco, August to September, 1886 (no. 379), and by Mr. Pringle near Guadalajara, 15 September, 1893 (no. 5164).

GALACTIA MULTIFLORA. Stems slender, woody, grayish brown, much branched, ascending, not twining: twigs, petioles, and peduncles cinereous-tomentose: leaves pinnately trifoliate; leaflets oval or somewhat obovate, rounded or retuse at the apex, dull green and glabrate above, cinereous-tomentose beneath; veins slightly prominent beneath; the lateral veins 7 to 9 pairs, parallel; margin slightly thickened and revolute; terminal leaflet 15 lines in length, two thirds as broad; the lateral slightly smaller: racemes axillary, 2–3 inches in length: buds acutely lanceolate in outline: calyx purplish, silky-villous, deeply 4-cleft, 4 lines in length; the upper segment oblong, acuminate; the

others linear or lance-linear, attenuate: corolla (in a dried state) deep purple, striated with green, 5-6 lines in length; standard obovate, entire at the base; alae oblong, strongly auricled upon the upper edge; keel but slightly curved: stamens alternately shorter, one free. — Collected on rocky hills about Tequila, 1 July, 1893 (no. 4433). Fruiting specimens belonging to this species and collected in the same locality, 24 September, 1893, have leaflets 2-2½ inches in length, and oblong acuminate pubescent legumes.

ERIOSEMA MULTIFLORUM. A shrub, 3-4 feet high: stems brownish, furrowed-angulate, branched; branches covered with fine silky reflexed appressed pubescence: stipules ovate, acuminate, 2½-3 lines long, silky pubescent, tardily deciduous: leaves ascending, 3-foliate; common petioles 1-2 lines long; leaflets elliptic-oblong, obtuse, often apiculate, pale green, firm in texture, 3-nerved, finely pubescent above, appressed silky-villous beneath especially upon the prominent veins, 1½-2 inches long, a third as broad; the edges revolute: racemes crowded at the ends of the branches, subsessile, densely flowered, 1½-2½ inches long: bracts caducous ovate-rhombic, acuminate, silky, 2-3 lines long, somewhat exceeding the ascending pedicels: calyx finely pubescent, campanulate, rounded at the base, gibbous upon the upper side, parted to the middle; the segments lanceolate, attenuate; corolla yellow, 6 lines in length; standard with a slight bifornicate thickening just below the middle upon the inner surface; vexillar stamen free and with a bulbous thickening at the base: pods (scarcely mature) broadly oblong, shortly and obliquely acuminate, 7-8 lines in length, rufescent silky-villous, 2-seeded. — Collected on rocky hills near Tequila, 7 October, 1893 (no. 4548). This species stands near *E. grandiflorum*, Seem., but differs in its smaller, more numerous, and densely racemed flowers.

MIMOSA TEQUILANA, Wats. Excellent fruiting specimens found by Mr. Pringle on hillsides near Tequila, 26 September, 1893 (no. 4596), furnish the following characters not shown in the type: pods about 6 in a head, flat, thin, oblong, acute, about 3-seeded, ¾ inch long, 2½ lines wide, covered with weak transversely spreading prickles.

BEGONIA PALMARIS, A.DC. Mr. Pringle has been fortunate in rediscovering this species and securing the hitherto unobserved fertile plant. His excellent specimens, kindly identified by Monsieur Autran with the type in Herb. Boissier, furnish the following supplementary characters: plants apparently dioecious, 2-4 feet high: lower leaves much larger than the upper (hitherto described), becoming 8 or 9 inches broad: petioles 2 inches in length: lobes of the fertile flowers

white, broadly ovate, acute, sharply denticulate, smooth or sparingly pubescent upon the outer surface; the three outer ones 9 lines long, 6 lines broad; the two inner somewhat smaller: pistil of § *Knesebeckia*, A.DC.; ovary pubescent; capsule 8 lines long, 3-winged; wings unequal, broadest near the base. — Fruiting specimens collected on a barranca near Guadalajara, 23 September, 1891 (no. 5178); flowering plants of both sexes were collected in rich soil on shaded rocky slopes of barranca near Guadalajara, 29 July, 1893 (no. 4474).

RANDIA WATSONI. (*R. tomentosa*, Wats. Proc. Amer. Acad. xxv. 152, not of Blume.) Mr. Pringle's no. 4383, collected on lava beds near Zapotlan, 20 May, 1893, corresponds to the type of Dr. Watson's species except in its somewhat more obtuse leaves, and doubtless should be referred to this species. It furnishes the following additional characters: buds clavate, an inch in length, curved upward: calyx silky, 3 lines in length; segments short, linear; sinuses rounded: corolla tube 9 lines long, hirsute upon the outer surface; limb abruptly spreading, nearly or quite an inch in breadth; segments oval: anthers oblong, apiculate, sessile in the orifice of the corolla: stigma 2-lobed.

VALERIANA PALMERI, Gray. Mr. Pringle's specimens of this plant show that the root terminates in a small oblong tuber-like enlargement about half an inch in length. — Collected on shaded banks near Guadalajara, 2 September, 1893 (no. 4521).

STEVIA SERRATA, Cav., var. **OVALIS**. Leaves short, oval, scarcely narrowed at the base, 10–12 lines long, 5–7 lines broad. — Collected by Dr. Edward Palmer on the Rio Blanca, Jalisco, July, 1886 (no. 309), and by Mr. Pringle on rocky hills near Guadalajara, 28 August, 1893 (no. 4491). Mr. Pringle's no. 602, from Chihuahua, 1886, is nearly the same.

GUARDIOLA ROTUNDIFOLIA. Glabrous: stem rigid, brown, finely furrowed: leaves thickish, ovate-orbicular, closely sessile and clasping, remotely denticulate, cuspidate, glaucous, $1\frac{1}{2}$ – $2\frac{1}{2}$ inches in diameter: inflorescences about 3-headed, closely subtended by floral leaves: scales of the involucre 4–5 lines long, finely striated, ovate, narrowed to an obtuse point: achenes $2\frac{1}{2}$ lines in length, mottled, truncate, contracted below to a thick short stipe: corollas in a dried state greenish. — Collected on hills near Tequila, 15 October, 1893 (no. 4571). Near *G. platyphylla*, Gray, but with larger, more orbicular, less dentate, and more clasping leaves; fewer larger heads, with broader involucral bracts.

LIABUM CERVINUM. Arachnoid-tomentose, 2 feet in height: stem

simple, leafy to the summit, furrowed, springing from large tuberous-thickened and clustered roots: leaves 5-6 inches in length, glabrate above, white woolly beneath except upon the nerves, narrowly connate, deeply and palmately cleft into linear attenuate one-nerved spinulose-denticulate segments; the latter 2-3 lines in breadth, with revolute margins: peduncles and involucre densely fuscous-tomentose: heads corymbose, about 6, discoid, an inch in height: scales of the involucre lance-linear; the outer shorter: corollas yellow, 5-6 lines long; the tube hirsute: achene silky; pappus tawny, readily deciduous. — Collected on bluffs of barrancas, San Marcos, 9 June, 1893 (no. 4398). Near *L. Palmeri*, Gray, but differing in its arachnoid and not glandular stem, leafy to the summit, its somewhat larger heads and more imbricated involucre, as well as in the more acute segments of the leaves, which in their mode of forking much resemble stag-horns.

ASCLEPIAS JALISCANA. Stem simple or sub-simple, erect, setose-hirsute, a foot in height: leaves sessile, oval to ovate-oblong, with rounded apex, sparingly hirsute upon both surfaces, ciliolate, glaucous beneath: flowers large, greenish, in several pedunculate, rather few-flowered umbels; peduncles 8 lines to 1 inch long, little exceeding the pedicels; both hirsute: calyx segments lance-linear, half as long as the corolla lobes; the latter reflexed, 5 lines in length, purplish upon the lower surface, green upon the upper: hoods $2\frac{1}{2}$ -3 lines long, scarcely at all auriculate at the inner angles; horn broad and conspicuously exserted: fruit tomentose, slender, fusiform. — Collected on the Rio Blanco, Jalisco, by Dr. Edward Palmer, in June, 1886 (no. 20^f); then by Mr. Pringle in plains near Guadalajara, June, 1889 (no. 3020), and again in dry soil, on plains and hills near the same city, July, 1893 (no. 4444). This species has the pubescence and much of the habit of *A. setosa*, Benth., with which it has been hitherto confounded. It is to be distinguished by its broader and more obtuse leaves, more glaucous beneath, its sub-simple stem, and its somewhat larger flowers with scarcely auriculate hoods and broad horns. Hartweg's no. 213, Bentham's type, as well as a number of other specimens correctly referred to his species, show that in it the horn is relatively slender and the hoods well auricled at the upper inner angles.

GONOLOBUS SORORIUS, Gray (Proc. Amer. Acad. xxii. 437), described from fruiting specimens, is now shown in flower by Mr. Pringle's no. 4435, collected on rocky bluffs above Tequila, 3 July, 1893. The following characters may be added: flowers in numerous axillary short-peduncled or subsessile umbels; pedicels 6-8 lines long: calyx segments lance-linear, obtusish, spreading or reflexed: corolla

yellow, 5 lines in diameter; segments ovate-lanceolate, acutish; orifice covered with a conspicuous dense white beard: anther cells nearly upright: crown of five short obtuse scales, adnate to the base of the corolla. — In foliage and bearded corolla this species approaches *G. barbatus*, HBK., which, however, has larger flowers and is from the coast.

PHEROTRICHIS LEPTOGENIA. Densely hirsute: stems simple, erect, 1–2 feet in height, from a fusiform root: leaves short-petioled, obtuse; the lower oval, smaller, subcordate; the upper ovate to ovate-lanceolate: flowers in successive sessile intra- and super-axillary umbels; pedicels 3 lines long: calyx hirsute; segments lanceolate, acute, $1\frac{1}{2}$ lines long: corolla 4–6 lines in breadth; its segments widely spreading, oblong-ovate, obtuse, greenish, striped with yellow, very thinly bearded or glabrate: corona equalling but not exceeding the stigma: membranous appendages of the anthers conspicuous: appendage of the stigma conical obtuse. — Collected on hills near Patzcuaro, 30 July, 1892 (no. 5279), and again on dry slopes near Guadalajara, 25 July, 1893 (no. 4466). Possessing the habit of *P. Schaffneri*, Gray, and *P. Balbisii*, Gray, but differing in its somewhat larger, more open and almost glabrous corolla. Mr. Pringle's no. 1148, collected in the Mapula Mountains of Chihuahua, 26 October, 1886, is the same, and shows the fruit to be lanceolate in outline, very acute and hirsute, $2\frac{1}{2}$ inches in length.

EHRETIA CORDIFOLIA. A large tree with light brown glabrate branches; branchlets somewhat hirsute; lenticels conspicuous: leaves thick, of harsh texture, ovate, obtusish or very shortly acuminate, serrate, cordate or subcordate, scabrous above, paler and soft pubescent beneath, 2–3 inches in length, two thirds as broad; petioles pubescent, $\frac{1}{2}$ inch in length: panicles terminal, only 1– $1\frac{1}{2}$ inches in length: sepals ovate-lanceolate, a line long: fruit oblong, 4-celled, 4 lines in length, $2\frac{1}{2}$ lines in diameter. — Collected in valley, Zapotlan, 19 May, 1893 (no. 4382). Of this species fruiting specimens only are at hand. They possess a strong habitual resemblance to *E. Mexicana*, Wats., but have broader cordate leaves.

IPOMŒA STANS, Cav., var. **HIRSUTA.** Very hirsute: leaves broad, sessile: sepals short, suborbicular. Collected by Dr. Edward Palmer on the Rio Blanco, Jalisco, August, 1886 (no. 324), and by Mr. Pringle on plains near Guadalajara, 30 August, 1893 (no. 4488). The typical form is merely puberulent, and has longer relatively narrower sepals.

IPOMŒA PERLONGA. Stem a little puberulent or glabrous, slightly

armed with a few small scattered prickles: leaves orbicular, deeply cordate, shortly acuminate, entire, 2-4 inches in diameter, glabrous at maturity, somewhat paler beneath; petioles $1\frac{1}{2}$ - $2\frac{1}{2}$ inches in length: peduncles very long, becoming nearly a foot in length, each bearing a regular rather closely 6 to 12-flowered cyme: pedicels thickened upward and becoming deflexed in fruit, 3-8 lines long: sepals smooth, ovate-oblong, obtuse, apiculate, in anthesis but $2\frac{1}{2}$ lines in length, becoming enlarged in fruit: corolla funnel-shaped, $1\frac{3}{4}$ inches long; the tube and throat rather slender, white; the limb bright blue (purple in dried specimen), $1\frac{1}{3}$ inches in diameter: fruit globose, apiculate. — Collected on hills about Tequila, 15 October, 1893 (no. 4531). Distinguished by its strikingly long-peduncled inflorescences and markedly bicolorous corolla.

EVOLVULUS PROSTRATUS. Perennial: root perpendicular with horizontal branches: proper stem very short; branches 4 to 8, prostrate, simple, 4-6 inches in length, silky-villous: leaves imbricated in two rows and somewhat reflexed, suborbicular, rounded at the apex, rounded or subcordate at the base, 4-5 lines in diameter, subsessile, glabrous above, silky-villous beneath: buds and fruit entirely concealed beneath the leaves: flowers raised between them; peduncles $1\frac{1}{2}$ lines in length, equalling the calyx, both villous: corolla white, 2 lines in diameter: capsule 2-3-seeded; seeds dull brown. — First collected by Dr. Thomas Coulter in Mexico without exact locality (no. 1011); then by Bourgeau in the Valley of Mexico at Santa Fé, 5 July, 1865-6 (no. 323), wrongly referred to *E. holosericeus*, HBK. Collected by Mr. Pringle on dry thin soil of hills near Guadalajara, 26 July, 1893 (no. 4445). In vegetative habit this species strongly suggests *Lysimachia nummularia*.

BASSOVIA DONNELL-SMITHII, Coulter (Bot. Gaz. xvi. 145). Mr. Pringle has rediscovered this Guatemalan plant in the barranca of Beltran, 6 June, 1893 (no. 4378). The range is thus considerably extended. His specimens and field notes show that the stem is about 10 feet high, twice regularly dichotomously branched. The calyx is somewhat accrescent, and the fruit is globular, orange-red, many-seeded, and about 5 lines in diameter.

PINGUICULA PARVIFOLIA. Base a small loose bulb, 4 lines in diameter, provided with a number of fine fibrous roots: leaves 3 to 5, elliptic-oblong, at the time of flowering not exceeding 3 lines in length and $1\frac{1}{4}$ lines in breadth; petioles margined and becoming broad and somewhat scarious below: scape single, strict or slightly curved, very minutely glandular near the summit: the five segments of the

calyx subequal, lance-linear, acutish, scarcely exceeding $1\frac{1}{2}$ lines in length: corolla 6–8 lines long; the limb bluish purple; the segments broadly oblong or somewhat spatulate; throat yellow as well as the tapering nearly straight or moderately curved spur ($2-2\frac{1}{2}$ lines in length). — Collected on mossy gravel bluffs near Guadalajara, 23 June, 1893 (no. 4397). An attractive little species distinguished by its paucity of foliage.

VITEX PYRAMIDATA. Tall shrub, 10–15 feet in height: branchlets, petioles, and inflorescences pulverulent-pubescent: petioles long, deeply sulcate above: leaflets 5, elliptic, mucronate, entire, rounded at the base, becoming decidedly coriaceous with age, green and smoothish above, with sulcate veins and minute reticulation, pale and tomentose beneath, 3–4 inches long, nearly half as broad; petiolules 3 lines long: the sulcate peduncles springing from the upper axils and bearing rather dense compound pyramidal panicles, sometimes subtended by two trifoliate bracts: calyx scarcely a line in length, shortly 5-toothed: corolla strongly bilabiate, about 6 lines long; the tube enlarged upward, about equalling the limb; segments rounded, ovate, the two upper suberect, the lowest the largest: stamens exserted, recurved at the summit, anther cells divergent: fruit 6 lines in diameter, consisting of a tough exocarp surrounding an irregularly sculptured woody endocarp, enclosing four 1-seeded cells. — Tequila, Jalisco, August, 1886, collected by Dr. Edward Palmer; rediscovered by Mr. Pringle on rocky hillsides about Tequila, 29 June, 1893 (no. 4429). Dr. Palmer's fruiting specimen was referred to *V. mollis*, HBK., by Dr. Watson (Proc. Amer. Acad. xxii. 444). He states also that the dark brown fruit is eaten by the natives under the name of "ahuilote." Mr. Pringle's flowering specimens show the plant to be amply distinct from *V. mollis*. The paniculate inflorescence is rare in American species although common in those of the Old World.

CYTINUS OXYLEPIS. Fuscous and somewhat granular-tomentose, 2–3 inches high: the short scaly stem not greatly enlarged at the base, and not equalling in length the thick clavate inflorescence: scales both of the stem and inflorescence lanceolate or ovate-lanceolate, acuminate, smooth, spreading, $1\frac{1}{2}$ lines in length: flowers bisexual; segments of the perianth 6–7, ovate, acute, granular-fuscous upon the back, a line in length, united below into a shallow cup: anthers about 6, uniseriate and adnate to the short thick style: stigma obscurely lobed; ovaries more than half immersed in the thickened axis of the inflorescence; placenta 5–6. — Collected on lava beds near Zapotlan, 13 and 27 May, 1893 (no. 4373). A fungoid parasite upon woody

roots of *Bursera*. The stem is 3-4 lines in diameter and the inflorescence is 2-3 times as thick. The species appears to be distinguished from all other plants of the genus by its perfect flowers, as well as by its small and very acute scales.

PEDILANTHUS PRINGLEI. Stems smooth, alternately few-branched: leaves closely and softly puberulent upon both surfaces, lanceolate, acuminate, $1\frac{1}{2}$ -2 inches long, subsessile by an abruptly narrowed base; midrib prominent and white below; bracts minute, grayish tomentose, caducous; pedicels $1\frac{1}{2}$ -3 lines long: involucre acutish at the base, dark purplish red, 5 lines long; the upper lip quadri-glandular at the base inside, glabrous, abruptly bent, attenuate to a very narrow but truncate entire or slightly retuse apex; segments of the lower lip finely ciliated, otherwise glabrous; style slender, dark red, trifid; capsule smooth, $3-3\frac{1}{2}$ lines in length upon a stipe ($\frac{1}{2}$ inch long); seeds ashy, ovoid, apiculate. — Collected on limestone ledges, Las Palmas, San Luis Potosi, 25 July, 1891 (no. 5107). Near *P. Tithymaloides*, Poir., but with smaller puberulent leaves, darker colored involucre, acutish at the base and with a more slender and attenuate upper lobe.

ACALYPHA HYPOGÆA, Wats. (Proc. Am. Acad. xxii. 451). Has been rediscovered by Mr. Pringle on damp slopes near Guadalajara, 28 July, 1893 (no. 4460). His specimens show the following additional characters: stem hirsute, 4-6 inches in height: the largest leaves 15 lines in length: staminate spikes very small, $1-2\frac{1}{2}$ lines long, upon slender axillary often deflexed peduncles (a line in length).

ACALYPHA POLYSTACHYA, Jacq. *A. filifera*, Wats. (Proc. Am. Acad. xxii. 451), has been again found by Mr. Pringle in Jalisco (no. 4470). As Dr. Rose notes, this species is not to be distinguished from *A. polystachya*, Jacq., represented by a rather wooden plate in the Hortus Schönbrunensis.

LIPARIS GALEOTTIANA, Hemsl. This species, insufficiently characterized by Richard and Galeotti, Ann. Sci. Nat., ser. 3, iii. 18, as *Malaxis Galeottiana*, was transferred to *Liparis* by Mr. Hemsley, Gard. Chron. 1879, i. 559. No exact occurrence of the plant in Mexico was known until Dr. Watson, Proc. Am. Acad. xxii. 454, doubtfully identified with the description a specimen collected by Dr. Palmer on the Rio Blanco, Jalisco. Mr. Pringle has secured the same plant on the Sierra Madre, Chihuahua, 30 September, 1887 (no. 1527), and on moist slopes, Patzcuaro, 18 July, 1892 (no. 5274), and finally on dry granitic hills near Guadalajara, 17 August, 1893 (no. 4512). A portion of the last mentioned specimen was sent to Kew, where it was definitely identified with the species in question. Mr. Pringle's speci-

mens bear out Dr. Watson's amplification of the characters, and confirm its distinctness from *L. elliptica*, Reichb. f.

ISOCHILUS UNILATERALE. Glabrous: stems several, slender, simple, 8 inches in height, roughened especially near the base by numerous minute warts: leaves linear, slightly retuse, rather rigidly erect, $1\frac{1}{2}$ –2 inches long, finely striated: racemes single, simple, terminal, secund, about 7-flowered: bracts oblong, obtuse, purplish; pedicels exerted 2–3 lines: flowers large for the genus, 6 lines long, purple, strongly gibbous upon the side toward the labellum, not noticeably fleshy: sepals subequal in length, carinate, acutish: petals oblong, obtusish, slightly broader than the sepals, and not carinate; labellum lance-oblong, with the sigmoid flexure characteristic of the genus but without lateral lobes: fruit 6 lines in length. — Collected on oaks, Tamasopo Cañon, 23 June, 1891 (no. 5116). This species, with much the habit of *I. lineare*, R. Br., has larger more one-sided flowers in a looser raceme.

NEMASTYLIS FLAVA. Bulb ovoid, 8 lines in diameter, dark brown, with a tuft of fibrous roots at the base; stems or rather scapes 1 to 3, slender, simple, leafy only at the base, 8–10 inches high, bearing at the summit a single 2–3-flowered spathe of 3 unequal lance-linear or linear-oblong acuminate bracts (the largest $1\frac{1}{2}$ – $1\frac{3}{4}$ inches in length): the outer leaves reduced to acute scale-like sheaths; the inner narrowly linear, attenuate, equalling the scape: pedicels about an inch long: flowers 1 – $1\frac{1}{4}$ inches in diameter, bright yellow: segments oblanceolate to obovate, acuminate; the outer 7 lines in length; the inner two thirds as long and with rounded thickened areolæ at the base: filaments connate; column $1\frac{1}{2}$ lines high; anthers $2\frac{1}{2}$ lines long, inclining to curl with age: capsule ovoid, smooth, shallowly six-furrowed, $\frac{1}{2}$ inch in length. — Collected on gravelly soil near Guadalajara, 23 June and 21 August, 1893 (no. 4400). Near *N. bracteolata*, Baker, but with single heads, distinctly unequal perianth segments, and, of course, different geographic position.

DIOSCOREA GRANDIFOLIA, Schlecht. Mr. Pringle's no. 4547, collected on talus of cliffs, barranca of Tequila, 4 October, 1893, corresponds well to the characterization of this species. The fertile plant, of which I find no description, furnishes the following characters: fruiting racemes about 3 inches in length upon peduncles about an inch long: fruit elliptic in outline, reflexed-spreading, not closely imbricated, 7 lines in length, half as wide.

D. PRINGLEI. Glabrous: stem twining: leaves ovate, acuminate, entire, cordate with an open sinus, 9–11-nerved, somewhat paler

beneath, 2-3 inches in length, about the same breadth: flowers of the staminate plant in slender compound racemes; the latter scarcely pedunculate, either solitary in the axils or borne at the successive nodes of the leafless ends of the stem; branches of the racemes numerous, about 5-flowered, the uppermost reduced and fewer-flowered: pedicels $\frac{1}{2}$ line long: bracts lance-linear, acuminate: perianth campanulate, pale yellow; segments obovate, rounded at the ends, $1\frac{1}{4}$ lines in length: stamens 3; filaments slender; rudiments none: fertile racemes axillary, short-peduncled, in fruit 2-3 inches in length: fruit suborbicular, retuse, $3\frac{1}{2}$ lines in diameter (immature). — Collected on grassy slopes of barranca near Guadalajara, 7 September, 1893 (no. 4526).

D. HIRSUTICAULIS. Pubescent-hirsute throughout with crisped white hairs: stem elongated, twining: leaves deltoid-ovate, acuminate, entire, cordate with an open sinus, about 9-nerved, 2-3 inches long, nearly as broad; petioles 8 lines in length: racemes of the staminate plant slender, simple, about $1\frac{1}{2}$ inches in length upon peduncles perhaps half as long, solitary in the axils or borne at the successive nodes of the nearly leafless ends of the stems; pedicels but $\frac{1}{3}$ - $\frac{1}{2}$ line in length: perianth campanulate, a line in diameter; segments ovate-oblong, obtuse: stamens only 3, filaments short and straight: inflorescences of the female plant axillary, solitary, in fruit $1\frac{1}{4}$ inches in length, $\frac{3}{4}$ inch in diameter: fruit stramineous, broadly elliptic, smooth, $4\frac{1}{2}$ lines in length, $3\frac{1}{2}$ lines in breadth, reflexed and very densely imbricated. — Collected under dry ledges, barranca of Tequila, 14 October, 1893 (no. 4572).

D. PLUMIFERA. Glabrous: stems twining: leaves thin, ovate acuminate, entire, cordate with a broad sinus, 7-11-veined, slightly paler beneath, $2\frac{1}{2}$ -3 inches long, 2 inches broad: staminate flowers yellowish green, $2\frac{1}{2}$ lines in diameter, borne in long slender feathery panicles; the latter geminate at the axils, 4 inches in length, $\frac{1}{2}$ inch in diameter; the numerous short lateral branches about 3-flowered; pedicels $\frac{3}{4}$ -1 line long, very slender: bracts lance-linear, acuminate, 1 line in length: segments of the perianth oblong-lanceolate, obtuse: fertile stamens 3, slender, not at all rigid or divaricate, alternating with 3 rudiments: racemes of the fruiting plant short-peduncled, densely flowered, 2 inches in length: fruit (scarcely mature) broadly elliptic, 4 lines long, reflexed, imbricated. — Collected under cliffs, barranca of Tequila, 14 October, 1893 (no. 4530).

D. MILITARIS. A slender vine 2-4 feet in length: stem smooth, from a small tuber: leaves rather distant, 3-lobed and halberd-shaped,

hirsute-pubescent upon both surfaces; the central lobe lanceolate attenuate to a sharp point, 3-nerved, $1\frac{1}{4}$ – $2\frac{1}{2}$ inches long, 3–7 lines broad; lateral lobes 6–8 lines long, somewhat falcate, obtuse; the uppermost leaves reduced, entire; petioles $\frac{1}{2}$ inch long: staminate racemes slender, loosely flowered, including the peduncle 2–4 inches long: pedicels $\frac{1}{2}$ line long, equalling or somewhat exceeding the minute-subulate bractlets: perianth $1\frac{1}{4}$ lines broad; segments of two forms; the 3 outer spreading, oblong, obtuse; the inner a little narrower and acutish, ascending, incurved: stamens 3, very short, perhaps one third as long as the segments of the perianth: fruiting raceme $1\frac{1}{2}$ –2 inches long upon peduncles of nearly equal length: capsules glabrous, reflexed, somewhat imbricated, elliptic in outline, 6 lines long, half as broad. — Collected upon the steep sides of wet cliffs of the barranca of Guadalajara, 8 September, 1893 (no. 5434).

III. — NOTES UPON THE GENUS GALINSOGA.

Few genera have been subject to so much doubt as to proper limitation as *Galinsoga*. This is equally evident from its treatment in De Candolle's Prodrômus, in which of its supposed six species five are questioned, and from the writings of subsequent authors who have dealt with it. Satisfactory generic limitations can perhaps only be obtained by a monograph including not only the plants hitherto ascribed to *Galinsoga*, but several neighboring genera, for which sufficient material could only be found in the larger foreign collections. Something, however, may well be done at more accurate specific and varietal definition of forms growing within our own country. So far as I know, only one species is at present recognized upon the continent of North America north of Mexico, that is *G. parviflora*, Cav. The telling characteristics of this species, when obtained from the earliest descriptions and figures as well as from the examination of material completely in accord with these, are as follows: stem and branches smoothish or finely and more or less appressed pubescent: rays white or whitish, little exserted: pappus of the disk flowers consisting of spatulate obtusish scales equalling the achene. Of this species several varieties have been suggested. Dr. Gray in the *Pl. Wrightianæ*, ii. 98, founded two upon the relative development or absence of the pappus in the ray flowers; namely, var. SEMICALVA, with naked ray achenes, and var. CARACASANA, with abortive ray pappus. The writer has examined a large number of specimens of the species both from North America and from the most widely separated regions of the world, and finds

that the ray pappus is never developed as in the disk flowers, but is always more or less abortive, consisting of fewer, shorter, and more slender bristles. Furthermore, the variation in its development seems absolutely independent of any other characters either floral or habitual, so that varieties founded upon this character can have no more than formal value. Indeed this is the view which Dr. Gray subsequently took in the *Synoptical Flora*, i. 303. On the other hand, the form and length of the pappus in the disk flowers seem more worthy of note, and several plants have recently been received at the Gray Herbarium which differ so materially in this regard and in their greater hispidity from the typical *G. parviflora*, Cav., as to call attention to the group. In those plants from the Eastern and Middle States, as cited below, the pubescence of the upper internodes is not only considerably more copious but much more spreading, the rays are bright white and well exerted, and the pappus scales of the disk flowers, while in length about equalling the achenes as in *G. parviflora*, have a very different form, being narrower and attenuate to a bristle-like apex. One of these specimens, collected by Mr. H. L. Clark at Pittsburg, Pa., was forwarded to Geneva for comparison with De Candolle's *G. parviflora*, var. *hispida*, and has been pronounced by M. Buser identical with that variety. Still a third plant of this genus quite distinct from the preceding has been collected upon waste land about Camden, N. J., by Mr. C. F. Parker. It is characterized by considerable pubescence, distinctly purple rays, and disk pappus but half as long as the achene. Portions of this plant have been forwarded to Geneva and Kew for comparison with *Vargasia Caracasana*, DC., and *Galinsoga hispida*, Benth., and it proves identical with both, while garden specimens of Regel's *G. brachystephana* show it with scarcely a doubt to be the same. This shows that Dr. Gray was in error in regarding his *G. parviflora*, var. *Caracasana* the equivalent of De Candolle's *Vargasia Caracasana*. While Mr. Parker's plant from Camden, the weed-centre of the United States, by no means shows this species of tropical origin to be established in our country, it may well be found that a portion of what has been hitherto referred to *G. parviflora* is this plant, especially as it is more or less extensively introduced in Eastern Europe, where it bears the name *G. brachystephana*, Regel. Summing up the different forms as well as the material at hand permits, we may divide them as follows.

* Rays white, pappus of the disk flowers about equalling the achene.

G. PARVIFLORA, Cav. Smoothish, the upper internodes with a sparing sub-appressed pubescence: pappus of the disk flowers of spatu-

late obtusish scales. — Ic. iii. 41, t. 281; DC. Prodr. v. 677; Gray, Syn. Fl. i. 393, including vars. *semicalva* and *Caracasana* of Pl. Wright. *Bidens mercurialis folia*, &c., Feuillée, Journ. Obs. Phys., &c. ii. 744, t. 32. — Generally distributed from New England to Oregon and southward to Mexico.

Var. *HISPIDA*, DC. Prodr. v. 677. Pubescence especially of the upper internodes more copious and not at all appressed: scales of the pappus in the disk flowers attenuate and bristle-tipped: foliage, etc. as in the type. Alleghany City, Pa., 9 August, 1869, *Porter*; Milwaukee, Wisc., October, 1881, *Sherman*; Providence, R. I., 5 July, 1892, *Bailey & Collins*; Pittsburg, Pa., 1893, *Clark*; Cambridge, Mass., and doubtless widely introduced. The same thing has been recently collected in Central America by Capt. John Donnell Smith, nos. 759, 2352, where it is doubtless indigenous. While in general readily distinguishable by the characters described, this variety occasionally so intergrades with the type that specific distinction seems very undesirable.

* * Rays purplish: pappus of the disk flowers but half as long as the achenes.

G. HISPIDA, Benth. Bot. Sulph. 119. The oldest name under the genus. *G. brachystephana*, Regel in Walper's Rep. vi. 722. *Vargasia Caracasana*, DC. Prodr. v. 676. Doubtfully established at Camden, N. J., 15 September, 1870, *C. F. Parker*. So far as the northern and eastern parts of our country are concerned, all these plants are doubtless introduced; in Texas, New Mexico, and Arizona forms of *G. parviflora* may well be indigenous, as Dr. Gray suggests.

IV. — MISCELLANEOUS NOTES AND NEW SPECIES.

SILENE SUBCILIATA. Perennial: stem strict, terete, glabrous, a foot and a half high, enlarged at the nodes: leaves glaucous, slightly fleshy and finely lepidote, narrowly oblong to linear-oblongate, glabrous on the surfaces but sparingly ciliated, $1\frac{1}{2}$ –2 inches long, obtusely pointed with callous tips, narrowed below to winged commonly ciliated petioles; floral leaves reduced to lance-linear acute bracts: flowers rather distant, pedicellate, forming an elongated racemiform inflorescence: bractlets lance-linear, ciliated: calyx glabrous, cylindric, 10 lines in length: petals deep red, $1\frac{1}{4}$ inches long; the blade elliptic, entire, obtuse; the appendages lanceolate, entire: fruit and seeds not seen. — Type in the Gray Herbarium, collected by Mr. Charles Wright, but without number or date, and bearing only the locality "Texas and Louisiana." It is to be hoped that this attractive species may be re-

discovered. It is evidently related to *S. regia*, Sims, and *S. laciniata*, Cav., but differs from the former very much in the form of its leaves, from the latter in its entire petals, and from both in the entire absence of glandular pubescence. From *S. Virginica*, L., it differs in petals, pubescence, and texture of the leaves.

SILENE LACINIATA, Cav. Prof. W. R. Dudley calls my attention to the fact that the seeds in this species and its broad-leaved variety (*S. Greggii*) are not infrequently vesicularly crested, as in the Californian *S. Parishii*, Wats.

ARENARIA GREENLANDICA, Spreng. This attractive species, possessing a wide and interesting north and south distribution, seems worthy of special study. The typical form, with subglobose obtusely pointed capsules and with stems few and decumbent from a spreading rosette of somewhat fleshy leaves, occurs chiefly in Greenland and Labrador. The common form of the mountains of Maine, New Hampshire, and Eastern New York becomes rather densely matted, and has many erect stems with very numerous erect less fleshy leaves about the base. Its capsules are ovoid to oblong and more or less acutely pointed. Although in temperate latitudes usually confined to rocky soil of the mountains or higher hills, this species descends nearly or quite to the seashore in Maine, at Bath and at Mt. Desert. It has also been found at Middletown, Conn. When growing at these lower altitudes, the plant is scarcely at all matted and the segregated few-stemmed individuals have simple or at least less fibrous roots and fewer thicker leaves than in the mountain form, with which however they are connected by frequent intergradations. In these forms also the capsule is ovoid or oblong rather than globose. Until recently the Shawangunk Mountains of New York have passed as the southern limit of this species, but there can be no doubt (see Mem. Torr. Club, iii. 14) that many of the specimens from the higher Mountains of North Carolina, hitherto referred to *A. glabra*, Michx., are practically identical with the plant of the White Mountains, notwithstanding the fact that the flowers average smaller. The question whether it is best to retain these forms of temperate regions in the same species with those of Greenland and Labrador presents much difficulty. The differences in habit, size of the flowers, and notching of the petals are often striking. Unfortunately, however, no one of these characters holds satisfactorily in a large series of specimens, and it appears that the change from the few-stemmed decumbent plant with a basal rosette of leaves and single simple root to the matted plant with fibrous roots and many stems, erect by mutual crowding, is a difference which may well be due exclusively

to the greater length of the season. As to the size of the flowers, a series of specimens collected at Mt. Desert by Mr. Redfield and Mr. Rand conclusively shows that this is largely a function of the season, the autumnal flowers being much smaller than the earlier ones, indeed far smaller than those of the southern form. The shape of the capsule gave promise of furnishing a good character, but the difference between globose and ovoid is not a sharp one, and on examination it proves that subglobose capsules occasionally occur in the White Mountain plant, and even in the few Greenland plants which could be examined the capsules were found to vary to ovoid, so that no sharp distinction can be founded upon this character.

DALEA NEGLECTA. Branches slender, terete, glabrous, glandular-punctate: leaves smooth, $1\frac{1}{2}$ –2 inches in length; leaflets 5–7 pairs and odd one, 4–5 lines long, elliptic or oblanceolate, petiolate, absolutely crenate, rounded at the apex, acute at the base, smooth and veinless above, glaucous, glandular-punctate and 1-nerved beneath: peduncles very slender, equalling or exceeding the curved loosely-flowered spike ($1\frac{1}{2}$ inches in length): flowers $2\frac{1}{2}$ –3 lines long, spreading or reflexed upon very short pedicels: calyx turbinate, strongly ribbed with yellow glands and covered with very short upwardly appressed or rather incurved hairs; teeth lance-linear, acute, inflexed, nearly equalling the tube: corolla in dried specimens bright purple. — Collected at Guanajuato, Mexico, by Prof. Alfred Dugès (no. 2576). Habit nearly of *D. nutans*, Willd. The peculiar pubescence of the calyx appears rather exceptional in the genus, being in most species straight, silky or lanate.

SAXIFRAGA PENNSYLVANICA, L. A specimen of this species, collected at Royalton, Vt., with deep red petals, has recently been received at the Gray Herbarium from Miss Emily P. Robinson of Manchester, N. H. A hasty search in the literature of the species has failed to show any record of this variation, the petals being always described as greenish or yellowish green. As the anthers are bright orange, the dark red or crimson petals give to the flowers a much more striking contrast of color, doubtless correlated with insect pollination. So far as observed, the specimen in question presented no other differences from the typical form.

ASTER PAUCICAPITATUS. Stems several, simple, flexuous, leafy to the summit, ribbed, somewhat pubescent, 10 inches to $1\frac{1}{2}$ feet high: leaves elliptic-oblong, obtuse or obtusish, mucronulate, sessile by a scarcely narrowed base, finely and somewhat glandularly pubescent, 9–16 lines long, 3–5 lines broad, erect or ascending: heads usually

single, terminal, short-peduncled, less frequently 3-4, corymbose, including the rays $1\frac{1}{4}$ - $1\frac{1}{2}$ inches in diameter: involucre of few subequal lance-linear attenuate finely pubescent and ciliolated scales; the latter loosely imbricated in 2-3 series, rather firm and broadly white-margined near the base, 4 lines long; the very acute tips often purplish: rays 12-18, white or pink, 6 lines in length, $1\frac{1}{2}$ lines in breadth, 3-toothed at the apex; disk flowers including the silky achenes 5 lines in length: pappus rather copious, of unequal bristles but not distinctly double. — *A. Engelmanni*, Gray, var. (?) *paucicapitatus*, Robinson, Proc. Am. Acad. xxvi. 176. — Collected by C. V. Piper in the Olympic Mountains, Washington, August and September, 1890 (nos. 926, 934). Never satisfied with the earlier and somewhat provisional disposition of this plant, I have returned to its study, and conclude that it is specifically distinct from *A. Engelmanni*, through its much less imbricated involucre of subequal scales. It should stand in the genus near *A. Xylorhiza*, Torr. & Gray.

DIOSCOREA DUGESII. Stem slender, climbing, angulate, sparingly pubescent with fine brown hairs: leaves ovate, cordate, sharply acuminate, thin, 9-nerved, pellucid-lineolate, nearly or quite smooth, $2\frac{1}{2}$ inches long, 2 inches broad; petioles pubescent, $1\frac{1}{2}$ inches long: staminate flowers $1\frac{1}{2}$ lines in diameter, borne in short slender simple solitary axillary pubescent racemes $1\frac{1}{2}$ -2 inches in length: peduncles but 2 lines long; pedicels scattered, $\frac{1}{2}$ line in length, 1-3-flowered: bracts subulate, considerably exceeding the pedicels: segments of the perianth linear-oblong or linear-lanceolate, obtuse, with crisped margins: stamens six, equal, inserted on the perianth near its base, half as long as the segments. (Fertile plant not seen.) — Collected by Prof. Alfred Dugès at Guanajuato, 1880 (no. 37). A slender species, somewhat resembling *D. remotiflora*, Kunth.